Suid-Afrikaanse Tydskrif vir Geneeskunde
South African Medical Journal

Posbus 643, Kaapstad P.O. Box 643, Cape Town

Kaapstad, 9 Augustus 1958 Weekliks 2s. 6d. | Deel 32 No. 32 Vol. 32 | Cape Town, 9 August 1958 Weekly 2s. 6d.

THE EPIDEMIOLOGY OF AMOEBIASIS IN DURBAN

LEONARD FREEDMAN, B.Sc., PH.D. (CAPE TOWN), *Research Officer, Amoebiasis Research Unit,* Durban*

The aetiological agent of amoebiasis, *Entamoeba histolytica*, is a cosmopolitan parasite whose distribution throughout the world is relatively uniform. Survey figures from various areas vary considerably, but there is good reason to suppose that most of this variation is due to selective sampling and to differences in laboratory technique. A fair average figure for the incidence of *E. histolytica* throughout the world would be 10%. From what evidence is available, it does not appear as if the incidence of this parasite is higher in places where the standard of hygiene is low.

A wide range of symptoms is often attributed to infections with *E. histolytica*, but it is difficult to be certain of the validity of this assumption in all cases. One can, however, be confident of the casual relationship in amoebic dysentery, its complications, and amoebic liver abscess. Symptomatic amoebiasis of this type is almost totally confined to rare, strictly localized epidemics and a few scattered endemic foci.

Blende (1955) has reviewed the sporadic epidemics. In all those which had been investigated in detail, there was, in a strictly localized group of people, the sudden appearance of large amounts of fresh sewage in the drinking water. When the link between sewage and water supply was removed, the outbreak was in each case halted, even though the parasites were still present in the population, and were presumably still being circulated by the routes available before the epidemic. A good recent example was the epidemic in a single factory in South Bend, Indiana, USA (LeMaistre *et al.*, 1956). The severely localized nature of the epidemics, and the immediate cessation of cases when the direct link between water supply and sewage was broken, makes the possibility of the coincidental introduction of a new pathogenic strain of *E. histolytica* in each of these epidemics remote. It would seem far more likely that either the number and kind of bacteria present in fresh sewage, or the number of amoebic cysts initially ingested, was the major cause of the new manifestation of the parasite.

The absolute dependence of *E. histolytica* on a living associate is well illustrated by the way in which certain antibiotics halt acute amoebic dysentery whilst not affecting amoebic liver abscess (Elsdon-Dew, Armstrong and Wilmot, 1952 and Wilmot, Armstrong and Elsdon-Dew, 1952). Further, in animal experiments, Phillips *et al.* (1955) have proved the inability of *E. histolytica* to survive and invade the bowel wall of germ-free guinea-pigs. In test-tube cultures, *E. histolytica* has not yet been grown in the absence of living cells. In our own experiments, we have shown that the mean size of a line of *E. histolytica* derived from bacteria-free human amoebic liver abscesses can vary greatly according to the bacterial associates provided (Freedman and Elsdon-Dew, 1958). In other experiments we have shown that a line of *E. histolytica* will form cysts in culture when accompanied by certain bacterial floras, but not when in the presence of others (Geekie, Freedman and Elsdon-Dew, 1958). As bacterial associates are so vital to *E. histolytica* in so many ways, it would not be surprising to find that they play a part in determining whether amoebae remain in the gut lumen as commensals or invade the tissues to become pathogens.

As to what the part played by bacteria may be, we have very little evidence, and most of that is confused. From the germ-free animal experiments for example, it is not clear whether it is for survival, rather than invasion, that the bacteria are essential. If bacteria are of importance for invasion, the epidemiological evidence suggests that the types responsible in man are likely to be those species which cannot survive long in sewage and sewage-contaminated materials.

The suggestion proposed here that the initial number of *E. histolytica* cysts ingested may play a part in deciding the course of an infection with this parasite has not been examined experimentally. It is based on the circumstantial evidence from epidemiological observations discussed in this paper, and by analogy with certain other protozoan parasites. An example of how different numbers of infecting parasites can alter the course of the disease which follows is particularly well illustrated by the work of Jankiewicz and Schofield (1934) on the coccidian, *Eimeria tenella*, which infects chickens. In their experiments they showed that doses of up to 150 sporulated oocysts produced no symptoms,

* The Amoebiasis Research Unit is sponsored by the South African Council for Scientific and Industrial Research, the Natal Provincial Administration, the University of Natal, and The United States Public Health Service (Grant E-1592).

150-500 caused slight haemorrhage but no deaths, 1,000-3,000 produced a fairly heavy degree of haemorrhage and a light mortality, 3,000-5,000 produced marked haemorrhage and a moderate mortality, while doses of more than 5,000 caused severe haemorrhage and a high mortality. The fact that clinical manifestations of *E. histolytica* are linked with bad hygiene, where large numbers of cysts would be ingested, suggests that some similar effect to the above may apply.

Durban is an endemic focus of symptomatic amoebiasis. In this city, there are 3 ethnic groups and in each the incidence of disease due to *E. histolytica* is different, although the incidence of the parasite itself appears to be much the same. In all its forms amoebiasis is common and severe in the African, but in the Indian and European, in that order, the disease is much less frequent and severe (Elsdon-Dew and Freedman, 1952). When the socio-economic backgrounds of the 3 groups are examined, it is clear that, in addition to the racial factor, hygiene and diet are also positively correlated with the frequency of the disease.

In considering the possible causes of the different behaviour of *E. histolytica* in the 3 groups in Durban, it is possible that the factors involved are different from those in the epidemics. However, it is far more likely that they are similar. Thus, the possibility of strain differences being responsible in Durban is as unlikely as in the epidemics. In Durban the Africans and Indians are the principal food handlers for the whole population, the former as cooks and the latter as market gardeners and purveyors of vegetables.

Diet as such played no part in the North American epidemics, but in Durban it may be of importance by (for example) altering the bowel flora to one favouring invasion. However, Africans with equally deficient diets in other parts of South Africa show no more symptomatic amoebiasis than their European neighbours. The possibility of climatic and topographical differences being important for the survival of bacteria and amoebic cysts must be borne in mind here as a possible complicating factor.

A racial difference *per se* seems unlikely to be involved in view of the fact that no racial discrimination was reported in the Thai Railway epidemic. Further, a people of closely related stock to the local African, the Natives of Lourenço Marques, have no more amoebiasis than their Portuguese coinhabitants (Elsdon-Dew, 1950). Lourenço Marques is only 300 miles to the north of Durban but the living conditions of the Natives are not of the slum type found in Durban.

In Durban then, as in the epidemics, we are left with the probability that either the types or number of bacteria in fresh sewage, or the initial number of *E. histolytica* cysts ingested, or both, underlie the invasion of the bowel wall by the parasite. In Durban, however, the process would be acting continuously owing to the bad hygienic conditions under which the majority of Africans in the area live.

Why the African does not have a higher over-all incidence of *E. histolytica* than the European is a paradox for their incidence of helminthic parasites is very much higher. (In Cato Manor, a bad slum area of Durban, 80% of the Africans examined had at least one species of helminth present—Elsdon-Dew and Horner, 1958.) Perhaps the body has certain natural defences against the establishment of *E. histolytica* in the bowel. Some such concept might well fit with the suggestion postulated above, that the number of cysts initially ingested, is the prime factor in deciding the future course of infection.

SUMMARY

Though on the evidence available we are unable to rule out completely the possibility that diet plays a part, it seems probable that the bad hygienic conditions under which the Africans live in Durban are the major cause of their high incidence of amoebic dysentery, its complications, and amoebic liver abscess. The ingestion of a very large number of *E. histolytica* cysts, or possibly the simultaneous ingestion of certain types of bacteria from fresh sewage, is the postulated precipitating factor which induces the amoeba to invade the bowel wall.

I should like to thank my colleagues in the Amoebiasis Research Unit, particularly Drs. R. Elsdon-Dew and A. J. Wilmot, for valuable discussions and suggestions on the subject matter of this paper.

REFERENCES

Blende, O. J. (1955): Northw. Med. (Seattle) **54**, 609.
Elsdon-Dew, R. (1950): An. Inst. Med. rop. (Lisboa), **7**, 223.
Elsdon-Dew, R., Armstrong, T. G. and Wilmot, A. J. (1952): Lancet, **2**, 104.
Elsdon-Dew, R. and Freedman, L. (1952): S. Afr. J. Clin. Sci., **3**, 59.
Elsdon-Dew, R. and Horner, R. H. (1958): S. Afr. Med. J., **32**, 145.
Freedman, L. and Elsdon-Dew, R. (1958): Nature, **181**, 433.
Geekie, H. A. W., Freedman, L. and Elsdon-Dew, R. (1958): Proc. Soc. Exp. Biol. (N.Y.). In press.
Jankiewicz, H. A. and Schofield, R. H. (1934): J. Amer. Vet. Med. Assoc., **84**, 507.
LeMaistre, C. A., Sappenfield, R., Culbertson, C., Carter, F. R. N., Offutt, A., Black, H. and Brooke, M. M. (1956): Amer. J. Hyg., **64**, 30.
Phillips, B. P., Wolfe, P. A., Rees, C. W., Gordon, H. A., Wright, W. H. and Reyniers, J. A. (1955): Amer. J. Trop. Med., **4**, 675.
Wilmot, A. J., Armstrong, T. G. and Elsdon-Dew, R. (1952): *Ibid.*, **1**, 429.

BOOKS RECEIVED : BOEKE ONTVANG

Action of Radiation on Tissues—An Introduction to Radiotherapy. By A. Lacassagne and G. Gricouroff. Translated by C. C. Lushbaugh and G. R. Riese. Pp. viii+199. 17 Figures. $6.25. New York and London: Grune & Stratton, Inc. 1958.

Counterfeit-Sex, Homosexuality, Impotence, Frigidity. 2nd Enlarged Edition. By Edmund Bergler, M.D. Pp. xvii+380. $6.50. New York and London: Grune & Stratton, Inc. 1958.

The Long Road Back—The Story of My Encounter with Polio. By Edward le Comte. Pp. 175. 20s. 6d. London: Victor Gollancz Ltd. 1958.

Drugs and the Mind. By Robert S. de Ropp. Pp. 310. 18s. London: Victor Gollancz Ltd. 1958.

Cardiovascular Diseases. 3rd Edition. Revised and Enlarged. By David Scherf, M.D., F.A.C.P. and Linn J. Boyd, M.D., F.A.C. Pp. xvi+829. 119 Figures. $17.75. New York and London: Grune & Stratton, Inc. 1958.

Official Records of the World Health Organization—No. 82—*The Work of WHO.* Annual Report of the Director-General to the World Health Assembly and to the United Nations. Pp. vii+183. 6s. 9d. Geneva: World Health Organization. 1958.

Neurochirurgia—Advances—Fortschritte—Progrès. Vol. I, No. 1, June 1958. Editors: C. Langmaid, T. Riechert and E. Woringer. Published twice a year provisionally, 2 copies will go to make one volume. Each copy will have some 80 to 100 pages. Subscription approximately DM 14.40 per copy plus postage. Stuttgart: Georg Thieme Verlag. 1958.

The Tissues of the Body—An Introduction to the Study of Anatomy. 4th Edition. By W. E. le Gros Clark, F.R.S. Pp. xii+415. 127 Figures. 40s. Oxford: Oxford University Press. 1958.

The Art of Clinical Refraction. By Theodore H. Whittington, M.D., M.R.C.P., D.O.M.S. Pp. viii+286+vii. 78 Figures. English Price 30s. London: Oxford University Press. 1958.

Suid-Afrikaanse Tydskrif vir Geneeskunde : South African Medical Journal

VAN DIE REDAKSIE

'N KOLLEGE VAN ALGEMENE PRAKTISYNS

Een van die probleme wat 'n geruime tyd lank al sorg baar in wye mediese kringe, is die probleem van die status van die algemene praktisyn en sy ware plek in die mediese professie. As gevolg van die invoer van die register vir spesiale registrasie van spesialiste 'n aantal jare gelede, en ook van weë die snelle uitbreiding van die omvang van mediese kennis, het daar 'n neiging ontstaan om die algemene praktisyn as 'n ‚mindere' geneesheer te beskou.

Hierdie neiging om die algemene praktisyn met 'n soort stigma te bejeën is verkeerd, ongesond en dit kan selfs noodlottig word vir die mediese professie as geheel. In die wêreld in die algemeen, en in 'n land soos Suid-Afrika, met sy wyduitgestrekte landelike gebiede, in die besonder, sal die algemene praktisyn altyd die spil bly waarom die mediese professie draai.

Maar dis nie net argumente wat gegrond is op ruimtelike en gebiedsoorwegings wat hier van belang is nie. Dit word vandag al meer algemeen aanvaar, in die kringe van denkende mense, dat *interpersoonlike verhoudinge* tussen mense van deurslaggewende belang geword het in 'n wêreld wat deur ideologiese verskille en magsonewewigtigheid bedreig word. Ook in die medisyne is daar 'n kentering aan die kom en dit word al meer in die vooruitsig gestel dat die algemene praktisyn iets van sy ou plek en status in die samelewing moet herwin—omdat sy besondere plek in die samelewing en die besondere aard van die werk wat hy doen, hom by uitnemendheid in staat stel om nie net 'n onpersoonlike medisyne-man te wees nie, maar 'n dinamiese vertroueling van mense.

Soos die mediese praktyk vandag in mekaar steek, behoort daar plek te wees vir die man met toegespitste vakkennis (die spesialis) wat mense net by geleentheid om 'n spesiale rede ondersoek en behandel, aan die een kant, en die man met genoegsame wydlopende vakkennis van al die vertakkinge van die medisyne (die algemene praktisyn) wat mense elke dag behandel en ondersoek en wat hulle in hulle binnekamers ken en nie net in hulle kisklere nie.

Die vraag wat ons dus moet beantwoord is hoe ons te werk moet gaan om 'n gesonder verhouding tussen spesialis en algemene praktisyn te bewerkstellig en wat ons kan doen om die status van die algemene praktisyn weer in ere te herstel.

Dit is besonder verblydend om te sien dat optrede in die regte rigting en langs positiewe weë reeds al van die algemene praktisyns self afkomstig is. Elders in ons blad[1] het ons 'n uiteensetting geplaas waarin die Weskaaplandse tak van algemene praktisyns (M.V.S.A.) *een* moontlike rigting van optrede aan die hand doen—naamlik die stigting van 'n Kollege van Algemene Praktisyns. Namens die Mediese Vereniging wil ons ons hiermee heelhartig vereenselwig.

Die algemene praktisyns voel self dat daar 'n werklike gevaar bestaan dat hulle vanweë ekonomiese of praktiese oorwegings, en ook vanweë isolasie en gebrek aan belangstelling, akademies geïsoleer mag raak. Op dié manier loop hulle gevaar om die bestaande fasiliteite wat opleidingshospitale bied, mis te loop. Hulle het in die verlede voortgegaan sonder 'n hoofkwartier, met geen invloed op die opleiding van ongekwalifiseerde mediese studente nie en met geen beheer oor nagraadse opleiding nie—dus ook sonder die status van hul spesialis-kollegas wat ook nog oor 'n Kollege van hul eie beskik.

Op die oomblik is daar geen bestaande Kollege of akademiese liggaam wat primêr die belange van die algemene praktisyn behartig nie. Die aangewese weg in hierdie verband is dus om die stigting van 'n Kollege van Algemene Praktisyns te bewerkstellig. So 'n Kollege sou van onskatbare waarde wees vir praktisyns op baie gebiede. Dit sou byvoorbeeld kon lei tot die stimulering van akademiese leierskap, tot verbetering van die moontlikhede van nagraadse studie vir algemene praktisyns, tot verhoging van die akademiese status van algemene praktisyns en dit sou selfs kon lei tot die heel praktiese ideaal dat iemand sou kan spesialiseer as spesialis-algemene praktisyn!

Kolleges van Algemene Praktisyns bestaan alreeds in Groot-Brittanje en in Amerika. Dr. Ian Grant, van Glasgow, is die huidige president van die Britse Kollege van Algemene Praktisyns en hy sal Suid-Afrika binnekort besoek op uitnodiging van die nasionale groep van algemene praktisyns van die Mediese Vereniging van Suid-Afrika. Hy sal al die belangrike sentrums in Suid-Afrika gedurende September 1958 besoek. Ons wil almal wat belangstel in die toekoms van 'n kerngesonde mediese professie in Suid-Afrika uitnooi om mee te werk om die besoek van Dr. Grant 'n sukses te maak. Ook wil ons almal wat in die saak belangstel, of wat oor nuttige en nodige informasie mag beskik aangaande die stigting en werking van so 'n Kollege van Algemene Praktisyns, uitnooi om deur middel van hulle onderskeie takke of ook deur middel van die meningskolomme van ons blad, uiting te gee aan hul menings en aanbevelings.

1. A College of General Practitioners (1958): S. Afr. Med. J., 32, 792.

EDITORIAL

WEIGHT LOSS AFTER GASTRECTOMY

The indications for surgical treatment of peptic ulcer are fairly well defined; and in most cases the operation of choice is partial gastrectomy. The results of this procedure are usually good and significant side-effects are uncommon. However, loss of weight is a common consequence; when a Polya operation is performed, 60-80% of patients fall below

their ideal weight, the average loss being 18 lb.[1,2] This is not necessarily bad, although it may have something to do with the alleged high incidence of tuberculosis after gastrectomy.

Malabsorption seems to be the principal factor causing this weight loss. While frank clinical evidence of steatorrhoea is rare, a significant defect in fat absorption can be demonstrated in most persons who have undergone gastrectomy.[3] It has been suggested that the weight loss is related to the amount of stomach removed, but this cannot be the sole explanation, for loss of weight[2] and indications of malabsorption[3] are found in many patients who have been treated by vagotomy plus gastro-jejunostomy. Inadvertent gastro-ileostomy causes very gross malabsorption because of the long blind loop;[4] and du Plessis[5] has invoked this mechanism to explain the milder defect when a gastro-jejunal anastomosis is made—he suggests that stagnation in the side-tracked loop of duodenum is partly to blame. Others have indicated that structural changes may develop in the small-bowel mucosa, but these are not thought to be of great significance.[6] The incidence and degree of weight loss appears to be lower when a gastro-duodenal anastomosis is made (Billroth-I gastrectomy),[7] but this may be partly due to the fact that less stomach is usually removed in this operation.

Ellison[1] feels that post-operative weight trends can be predicted: the 'gourmet' type usually does better after radical gastrectomy than the 'bird-like' individual who has never attained his ideal weight. He suggests that more conservative procedures should be considered in those thought likely to lose much weight; but one must remember that a healthy thin person will be happier than a person with a stomal ulcer.

One must not forget that the patient who has had a gastrectomy has a reduced stomach capacity; and meals should, if necessary, be frequent and small. As soon after the operation as possible solid foods of minimal volume and low bulk should be introduced; hypertonic fluids should be avoided. Full use should be made of the fact that the patient can now take seasoned foods. Unless the loss of weight is extreme, simple measures should suffice; and only if malabsorption is intractable should measures like the conversion of a gastro-jejunal to a gastro-duodenal anastomosis[5] be contemplated.

1. Ellison, E. H. (1957): Amer. J. Digest. Dis., 2, 669.
2. Everson, T. C., Hutchings, V. Z., Eisen, J. and Witanowski, M. F. (1957): Ann. Surg., 145, 182.
3. Ruffin, J. M., Shingleton, W. W., Baylin, G. J., Hymans, J. C., Isley, J. K., Sanders, A. P. and Sohmer, M. F. (1956): New Engl. J. Med., 255, 594.
4. Alvarez, W. C. (1957): Gastroenterology, 32, 145.
5. Du Plessis, D. J. (1956): Med. Proc., 2, 29.
6. Baird, I. McL. and Dodge, O. G. (1957): Quart. J. Med., 26, 393.
7. Schmitz, E. J., Harkins, H. N., Moore, H. G. and Olson, H. H. (1954): Lancet, 2, 4.

MALARIA CONTROL IN THE NORTHERN TRANSVAAL

C. J. H. BRINK, B.A., M.D., D.P.H., D.T.M.&HY.

Chief Regional Health Officer for Northern Transvaal, Union Department of Health, Pietersburg

The object of this paper is to present a short review of the present position in the Northern Transvaal as regards malaria control over an area of over 60,000 square miles with a population of about a million and a half with a relatively thin rural distribution.

As far back as 1930 a beginning was made to control malaria in the Northern Transvaal, when the late Dr. Siegfried Annecke started work from his headquarters at Tzaneen. With the materials then available a significant measure of success was attained by 1943. The anti-malaria organization was expanded after the war and it reached its present strength by 1947. Since then it has not failed in its purpose even during seasons most favourable for the epidemic spread of malaria. It is considered that well over 80% of the population at risk 10 years ago are now protected and free of risk from malaria.[1] A stage has now been reached where the disease may be considered as eradicated over large parts of the Northern Transvaal and hypo-endemic in the remaining areas, where the vector density had been greatly reduced by anti-mosquito measures and the parasite pool in man had consequently died out. The contact between vector and parasite, however, is subject to considerable fluctuations caused mainly by climatic variations. Control measures must therefore continually be adapted to these fluctuations.

Other factors, like the cost of malaria control, the possible development of resistance by the vector to the residual insecticides, or the development of resistance in the parasite against the 4- and 8-amino quinoline anti-malarial drugs like daraprim, make it necessary that methods of malaria control should be continually reviewed and adapted to changing circumstances. In his annual report for 1955 the Director General of the World Health Organization[2] draws attention to the danger that threatens tropical and sub-tropical countries if the malaria parasite or the vector develop the resistance that have been observed in certain areas such as Northern Nigeria and the Middle East. In the introduction of his report Dr. Candau[2] states that 'in the field of communicable diseases the main development in 1955 was the new approach to the malaria programme by the VIII World Health Assembly, who decided that, as the capacity of anopheline vectors to acquire resistance to insecticides can now be considered as an established fact, the only rational plan was to aim at the eradication of the disease in the shortest possible time wherever this is technically feasible'.

The further fact that the boundaries of the Northern Transvaal are common with those of 4 other territories where malaria occurs, has now become one of the most important factors to be taken into account in planning our future methods of malaria control. This factor has also been stressed by the WHO at its various recent Regional Malaria Conferences,[3] and elsewhere.[4] It is therefore necessary to show here how the malaria control measures which are being applied in the Northern Transvaal are designed to comply with the requirements of the VIII World Health Assembly, namely to eradicate malaria in the shortest possible time wherever this is technically feasible.

Malaria Incidence and Case Distribution

The number of cases of malaria that occur in an area is the most important indicator of the size of the malaria

problem and of the measures that should be taken to control it. In Table I are given the cases reported to the Union Health Department since 1950. The years 1950-52 were exceptionally

TABLE I. CASES OF MALARIA NOTIFIED IN THE NORTHERN TRANSVAAL 1950-57

Year ended 30 June	*No. of Cases*	*Year ended 30 June*	*No. of Cases*
1950 ..	51	1954 ..	104
1951 ..	41	1955 ..	251
1952 ..	19	1956 ..	131
1953 ..	700	1957 ..	92*

* 45 Europeans and 47 Natives.

dry and were followed by a number of years of heavy rains during the summer season. The table includes all cases reported by medical practitioners and hospitals in the Northern Transvaal region, but excludes a large number of cases which occurred in the Witwatersrand gold mines. These mines recruit a large proportion of their Native labour from

TABLE II. DISTRIBUTION OF MALARIA CASES IN NORTHERN TRANSVAAL, YEAR 1955-57

Area	*Districts*	*No. of Cases 1955-56*		*No. of Cases 1956-57*
West ..	Rustenburg	1	9	6
	Waterberg	8		
Central ..	Potgietersrus	2	5	1
	Pietersburg	3		
North ..	Soutpansberg ..	49	62	38
	Letaba..	13		
East ..	Pilgrims Rest ..	28	52	47
	Nelspruit	12		
	Barberton	12		

areas outside the Union, and during 1956-57 97 cases of malaria were reported by them. Amongst the malaria cases included in Table I 8 were imported by Natives who came from outside the Transvaal to work on rural farms, and 20 were imported European cases. Most of the cases in Europeans are due to carelessness when staying or moving

Fig. 1. Distribution of malaria cases in the Northern Transvaal, year ended 30 June 1957.

in the recognized dangerously malarious areas. In Table II is shown how the cases reported during the year 1956-57 are distributed in the Transvaal in comparison with the cases reported in the previous year. The details are further arranged to indicate more clearly the extent of the problem which remains to be solved. To illustrate the position further the details of Table II are shown on Map I (Fig. 1).

Malaria Mortality

With the introduction of more efficient anti-malarial drugs during and since World War II, the mortality from malaria is negligible. In Table III is given the mortality figures

TABLE III. MALARIA MORTALITY, NORTHERN TRANSVAAL, 1949-53

Year ended 30 June	*Whites*			*Non-Whites*			*Total*
	Male	*Female*	*Total*	*Male*	*Female*	*Total*	
1949 ..	4	2	6	21	7	28	34
1950 ..	5	3	8	7	2	9	17
1951 ..	6	4	10	11	1	12	22
1952 ..	4	1	5	8	3	11	16
1953 ..	3	5	8	41	27	68	76

compiled by the Bureau of Census and Statistics for 1949-53. The increase in the mortality figures for 1953 is partly the result of the enforcement of registration of deaths amongst Natives. An increase would also be the natural result of the higher case incidence in 1953 (Table I).

Spleen Rates

Another indication of the incidence of malaria is the spleen rate but this index is now considered to be approximately accurate only if the same observer examines the spleens. One medical officer could not inspect the spleens of a representative number of children in each part of the Northern Transvaal and spleen rates have been abandoned in favour of random sampling by taking a number of blood smears much larger than the number of spleens that could be examined.

Parasite Rates

Blood smears are now taken regularly by experienced technical assistants and health inspectors and from Table IV a clear indication can be obtained of where the highest

TABLE IV. PARASITE RATE: RANDOM SAMPLING BY THICK BLOOD SMEARS, NORTHERN TRANSVAAL

Area	*District*	*Year ended 30 June 1956*		*Year ended 30 June 1957*	
		No. taken	*No. positive*	*No. taken*	*No. positive*
West	Waterberg	385	1	1,821	—
Central	Potgietersrust ..	130	1	414	1
	Pietersburg ..	—	—	254	—
	Groblersdal ..	—	—	139	—
North	Soutpansberg ..	275	15	961	182 (18·9%)
	Tzaneen	454	—	2,038	89 (4·3%)
East	Lydenburg	321	1	200	—
	Pilgrims Rest ..	—	—	717	—
	Nelspruit	1,031	4	479	8 (1·7%)
	Barberton	70	3	604	13 (2·2%)
	Komatipoort ..	666	25	1,348	45 (3·3%)
Total	12	3,332	50	8,975	337 (3·6%)

parasite incidence occurs and where any danger remains. A thick smear is taken of each case and is stained in the laboratory at Tzaneen by Giemsa's method.

To obtain an indication to what extent malaria transmission still occurs in the eastern areas the number of positive blood smears were classified in Table V according to the

age and sex. It will be seen that there is a higher rate in males of school age but not in older males. After school age the males leave home to work in the mines or the larger towns, whereas the females remain exposed to malaria at home and therefore show a higher incidence throughout the higher age groups. Transmission is most intense in the Soutpansberg even in the lowest age groups. Further to clarify the distribution of the malaria parasite, Map II (Fig. 2) has been prepared to indicate more clearly than figures where the danger remains and where anti-malaria measures must be intensified.

TABLE V. RANDOM BLOOD SURVEY: MALARIA CARRIERS, NORTHERN TRANSVAAL, 1956-57

Age	0–12 months		13–24 months		2–4 years		5–9 years	
Sex	M	F	M	F	M	F	M	F
No. positive	3	—	11	4	20	23	64	45
No. tested	56	68	262	257	409	442	719	665
Percentage positive	5·4	0	4·2	1·6	4·9	5·2	8·9	6·8

Age	10–14 years		15–19 years		20–29 years		30–39 years	
Sex	M	F	M	F	M	F	M	F
No. positive	54	34	10	13	4	11	6	13
No. tested	605	614	329	217	152	280	187	312
Percentage positive	8·9	5·5	3·0	6·0	2·6	3·9	3·2	4·2

Age	40–49 years		50–59 years		60–69 years		70+ years		Total
Sex	M	F	M	F	M	F	M	F	
No. positive	1	6	3	7	2	2	—	1	337
No. tested	165	224	78	82	49	50	8	11	6,241
Percentage positive	0·6	2·7	3·9	8·5	4·1	4	0	9·1	5·4%

Fig. 2. Parasite distribution according to random blood survey, Northern Transvaal, year ended 30 June 1957.

Parasite Resistance

There is no indication of parasite resistance to any of the various amino-quinoline drugs; they have not been used intensively in a mass chemotherapy campaign. The reports of resistance concern mainly daraprim and so far trials have been limited to the use of chloroquine diphosphate (Avlochlor) on small groups. The difficulty is to trace in the Native areas, those cases who had received the drugs. Of 51 cases who had positive blood smears, only 28 could be traced after 2 months, and of these only 2 had positive blood slides. The attempt to administer the drug in those areas in the north-east part of Soutpansberg on the Limpopo River will be continued where the parasite rate is highest (see below). The cases are difficult to trace at certain seasons when they cross the Limpopo into foreign territory.

Research into the susceptibility of the parasite to the various amino-quinoline drugs, into variation in form of the parasite and its relapse pattern, was not attempted because of the relative rarity of the disease and the absence of adequate facilities to do this type of research. Apart from the finding of the parasite in cases of suspected malaria for the purpose of diagnosis, routine enquiry was made in order to determine the source and locality of infection. It is realized that problems in respect of the parasite await solution but it does not appear that the lack of a solution will materially retard the final attainment of the object of malaria eradication.

Chemotherapy

Several hospitals in the Soutpansberg and Pilgrims Rest districts reported in 1956 that they preferred camoquin (amodiaquine) in the treatment of cases of malaria because this had proved effective and no cases came back for treatment of a relapse. Over a period of 18 months up to June 1956, 50 cases were treated at Masana Hospital for falciparum malaria, 46 receiving camoquin with excellent results. Of the other cases one died of cerebral malaria and one developed haemaglobinurea after treatment with mepacrine. Over a period of $2\frac{1}{2}$ years the Elim Hospital reports only 24 cases, of which 23 suffered from *P. falciparum* and one from *P. malariae*; 12 cases were treated with camoquin, 7 with aralen (chloroquine) and 1 with atebrin and plasmoquin. The treatment of the other was not recorded but no deaths were noted.

Those district medical officers who replied to enquiries in 1956 stated that they rarely see cases who suffer from malaria. Whenever a case is suspected of suffering from malaria they resort to treatment with camoquin or chloroquine, usually without taking blood smears beforehand and with very satisfactory results. They stated that it was very easy to treat and cure the case at once and that they hesitate to delay cure in order to take blood smears for examination. They appear to be in danger of losing their clinical skill at diagnosing malaria because they rely on a therapeutic test of their suspicions. It was also remarked that paludrine does not give the dramatic results usually obtained by administration of camoquin or chloroquine, while daraprim does not appear to be often used.

There has been no observation showing that the local faciparum strain of the parasite has developed any resistance to the drugs used in treatment or in prophylaxis. Many tourists and officials who proceed to malarious areas use these 4-amino-quinolines prophylactically. However, one medical practitioner observed a party visiting Northern Rhodesia, of which one section used paludrine as a prophylactic and the other section chloroquine. After their return those who used paludrine developed malaria soon after stopping the prophylactic use of the drug, but none of those who used chloroquine developed malaria. The risk of

exposure to malaria infection appeared to be the same for both sections of the party. This medical practitioner has extensive experience in the treatment of malaria and is perturbed at the large number of non-immune persons who settle in the Soutpansberg district without taking any precautions against malaria infection.

Vector Incidence

Little investigation could be made in the last few years into the bionomics of the vector *A. gambiae* owing to loss of professional and technical staff. The position has now been rectified, and the work of testing resistance in malaria vectors and the effects of residual insecticides is in hand. The field staff, however, has continued to survey their areas regularly and carry on control work. For the check spraying of huts 4,173 gallons of pyagra in kerosene was used in the year 1956-57. Table VI indicates the results of their activities since 1951 in the search for vectors and their destruction. It will be noticed that in the abnormally wet years 1952-53 and 1954-55 the vector incidence was high; this resulted in the higher incidence of malaria shown in Table II. In order

TABLE VI. HABITATIONS TREATED AND VECTORS FOUND ON CHECK SPRAYING: NORTHERN TRANSVAAL, 1956-57

Year ending 30 June	*Total habitations sprayed*	*Huts checked*	*Vectors found*	*Vector/hut ratio*
1951 ..	356,819	168,812	1,572	1 : 107
1952 ..	320,785	175,063	1,133	1 : 139
1953 ..	414,787	145,219	5,806	1 : 25
1954 ..	287,566	149,911	716	1 : 208
1955 ..	352,863	170,763	3,512	1 : 48·6
1956 ..	288,730	170,762	902	1 : 189
1957 ..	300,774	183,275	3,280	1 : 55·8

to reduce the vector incidence a large number of habitations are sprayed as shown in Table VI. From this table it may be concluded that in favourable conditions such as occurred in 1952-53 and 1954-55 the vector does propagate itself rapidly and can be restrained only by the vigorous exertions of the anti-malarial organization. Further to illustrate the exact distribution of the vector, Map III (Fig. 3) and Map IV (Fig. 4) have been prepared for the year 1956-57 The maps indicate the presence of the vector in given areas but the absolute prevalence is not indicated. The vectors may have been found concentrated in a small number of huts or in limited areas. A comparison of Map III with Map IV shows how the larvae and adults were found along the Limpopo and other rivers and tributaries. It is the intention that this annual sequence of events should be limited by intensive larviciding measures every year, which will so decrease vector density as to ensure the eventual eradication of the malaria parasite in this area.

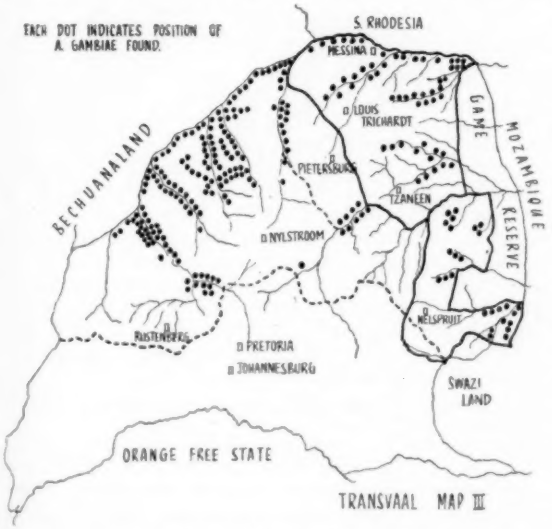

Fig. 3. Incidence of vector larvae, Northern Transvaal, year ended 30 June 1957.

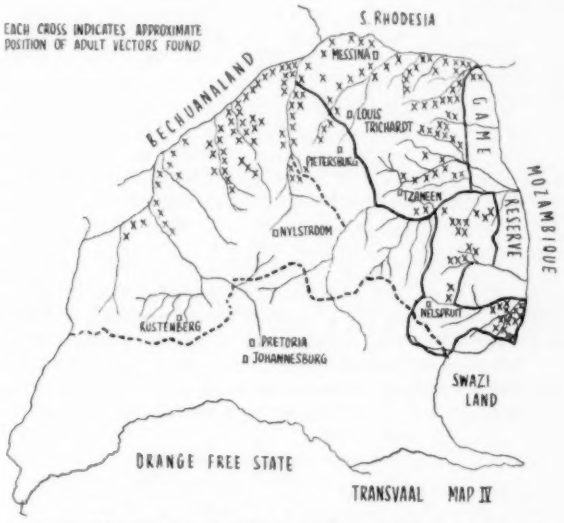

Fig. 4. Distribution of adult *A. gambiae*, Northern Transvaal, year ended 30 June 1957.

Vector Blood Meals

In order to determine the nature of the meals taken by the vector mosquito, the blood in the gut of 294 wild-caught specimens were pressed out on filter paper, marked and sent to the Lister Institute at Elstree, London, for serological identification.[5] From the results in Table VII it will be seen that only 4 specimens had definitely fed on man and these mosquitos all came from the areas where the parasite rate was high. This method of determining the extent of contact between the vector and man is relatively inexpensive and less exacting and time-consuming than dissection for finding the sporozoite rate. The mammals which were tested for besides man were the sheep, goat, horse, pig, dog, cat, while 'bovids' included ox, sheep, goat and giraffe. Notwithstanding that 24 of the 293 tests did not differentiate further than 'mammal' and that a small percentage may have been human blood, the method of testing is fairly accurate. It determines 258 blood meals out of 282, or 91·1%, and is to that extent of assistance as an indicator of the activity of the malaria vector, which can be taken as predominantly zoophilic, presumably because the human population is almost entirely protected by residual spraying indoors. This aspect of malaria is discussed in an interesting way by Davidson[6] and Lacan.[7]

TABLE VII. SEROLOGICAL IDENTIFICATION OF MOSQUITO BLOOD MEALS: NORTHERN TRANSVAAL, 1956

Type of Mosquito	Origin of Blood in Mosquito Meals							
	Man	*Ox*	*Horse*	*Pig*	*Bovid*	*Mammal*	*Negative*	*Total*
A. gambiae	4	194	3	2	47	22	11	283
A. cinereus	—	2	—	—	1	—	—	3
A. demeilloni	—	2	—	—	—	—	—	2
A. longipalpus	—	—	—	—	1	—	—	1
A. listeri	—	—	—	—	—	1	—	1
A. pretoriënsis	—	1	—	—	—	1	—	2
A. rufipes	—	1	—	—	—	—	—	—
Total	4	200	3	2	49	24	11	293

A. funestus has apparently been eradicated in this area, so that *A. gambiae* is the only vector of importance.

Organization of Anti-malaria Staff

For the purpose of malaria control, the Northern Transvaal is being divided into 39 areas of approximately 1,000 square miles each under the supervision of trained European field assistants with 15-25 trained Native labourers. The field assistant has a ¾-ton motor truck with which to move about in his area, to check on the work of the labourers, to do mosquito and larval surveys and to convey supplies of

Fig. 5. Areas under control of malaria field assistants, Northern Transvaal, 1957.

DDT and BHC to the points where it is needed by the labourers. The distribution of field assistants is shown in Map V (Fig. 5); each has a camp in his area from which he operates, where insecticides are stored and to which the bulk stores are brought from time to time as required. Each labourer is provided with sufficient insecticide for his area together with an Eclipse can and sprayer to spray with BHC wettable powder the huts and other outbuildings and structures where vectors find a hiding place. For antilarval work DDT-Emulsion M.25 and Malariol are used. The amounts of all insecticides used are shown in Table VIII. The number of huts sprayed with insecticide, the number of huts checked by pyrethrum sprays for the presence of adult *A. gambiae* and other anophelines, as well as the number of vectors found, is shown in Table VI.

TABLE VIII. MATERIALS USED IN VECTOR CONTROL: NORTHERN TRANSVAAL, 1951-57

Year ending 30 June	*DDT-emulsion (gallons)*	*DDT 5% (gallons)*	*BHC-40% wettable powder (lb.)*	*Malarial (44-gal. drums)*
1951 ..	2,238	11,924	111,608	8,602
1952 ..	1,802	3,964	127,808	4,595
1953 ..	3,222	15,389	118,404	3,164
1954 ..	3,009	10,363	141,434	469
1955 ..	4,147	15,263	168,649	201
1956 ..	3,436	6,395	125,652	238
1957 ..	3,911	5,584	129,121	474

In view of the reduced incidence of the vector, the parasite, and cases of malaria, the number of field assistants and the labour force was being reduced proportionately in 1957.

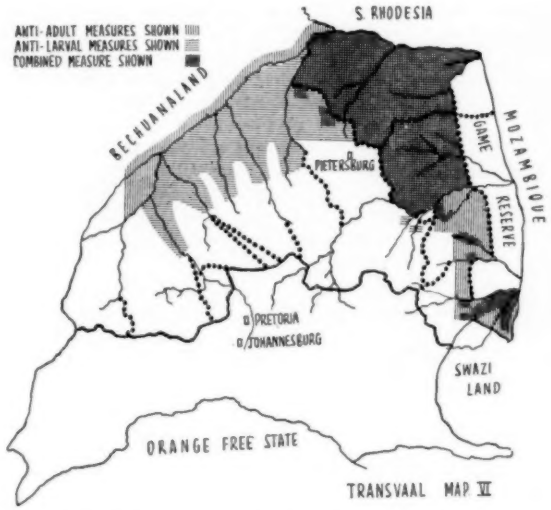

Fig. 6. Malaria vector control work in the Northern Transvaal, 1957.

From Map VI (Fig. 6) it will be seen that in the western and central areas of the Northern Transvaal the anti-larval work is limited to the large rivers where the vector breeds in winter, while residual spraying has been discontinued over the same areas to a large extent. In the northern and eastern areas

residual spraying still continues between once and twice every year.

Residual Spraying

DDT has been used for 10 years since 1947 as well as BHC later on, and so far no firm evidence of the development of resistance by the vector has been found. Now that it is realized[8, 9] that *A. gambiae* is a wild mosquito that only enters human habitations for its own convenience or owing to climatic conditions or pressure of mosquito population, a search in places other than human habitations has shown that practically as many vectors can at times be found out side as indoors. *A. gambiae* is not an obligatory domestic mosquito, but in the Northern Transvaal owing to its low density the search for it must be extensive and is usually only carried out by energetic and enthusiastic workers.

No systematic observations have been made on vector resistance by the Busvine test[10] but the work is in hand. Where the vector density is as low as in Northern Transvaal it is often impossible to find enough specimens to carry out a resistance test on wild-caught *A. gambiae*. Specimens from various areas are bred to ascertain whether any degree of resistance is present and whether it varies between different places in Northern Transvaal.

Vector Importation

A relatively minor danger is the importation of vectors in air and surface craft. Cases are known where vectors suddenly appeared nearly a hundred miles from the nearest known vector breeding places. This could only be explained by the fact that gravid vectors could be transported in motor vehicles which stay overnight near these breeding places, usually near the Limpopo River. Certain outbreaks of malaria in non-malarious areas might probably also be due to importation of infected vectors from malarious areas. If such importation of vectors becomes a menace to vector-free malarious areas steps may have to be taken to prevent its occurrence.

Anti-larval Measures

When it became evident that little further progress was being made in eradication through residual spraying, larviciding had been resorted to in areas which serve as the winter breeding places or vector nurseries, like the Limpopo River and its tributaries, Crocodile River and Olifants River. However extensively house-spraying and other anti-adult measures are carried out there will always be adults that escape and continue breeding in suitable places.

Larviciding by hand application with spraying apparatus is still the best method, because it enables the labourer to search out every pool and breeding place. Our present knowledge is based on many years of observation of the winter breeding places or nurseries of the vector along the large rivers and should enable us now to reduce the vector considerably by larvicidal measures.

Anti-larval measures must be taken during late winter and early summer, when the rivers are at their lowest and when pool formation in the river beds is limited, because later in the year floods assist by wiping out suitable breeding pools. To be effective these measures require to be coordinated on both sides of any river to avoid omitting important breeding places and so giving the vector a foothold to start breeding. This aspect is very important on rivers which form interterritorial boundaries, like the Limpopo, or where they cross boundaries, like the Olifants, Sabie, Crocodile and Komati Rivers.

Concern is often expressed at the continued simultaneous use of chemically related insecticides against both adults and larvae in the same areas, because the danger of development of resistance in the vector is greatest under such circumstances (Malaria Conference for the Western Pacific and South East Asia). Efforts are therefore being made in the Northern Transvaal to eradicate malaria as soos as possible, mainly by the destruction of the adults.

The need for larvicidal measures in addition to the imagocidal measures has been questioned mainly because it was believed that such a procedure, besides being expensive, induced resistance to the residual insecticides more quickly. This argument falls away now that Davidson has shown that resistance depends on a genetic factor. Experience in the Northern Transvaal has shown that winter conditions limit adult *A. gambiae* activity to defined stretches of the Limpopo, Olifants, Komati and other rivers. The water in these rivers is at its lowest during the day time just after July and August, depending on the amount and distribution of the rains during the previous summer. By carrying out fairly intensive anti-larval control in these larva-breeding stretches of rivers, the adults were limited to those river areas right into the summer season, which made much imagocidal work unnecessary.

Adults could always be controlled by resumption of residual spraying where they created a threat of malaria. Furthermore, large tracts of countryside are so thinly populated that imagocidal work is as expensive as larvicidal work. This argument of expense would not be valid if the residual insecticides could retain their activity over a period of 6-9 months. In that case it will have to be considered whether mass chemoprophylaxis in the remaining danger areas of the eastern part of the Northern Transvaal, together with residual spraying of all habitations and outhouses at the beginning of the summer, should not be adopted as the cheapest method of eradicating malaria. Until the prolonged action of the insecticides is proved and can be relied upon and until complete interterritorial cooperation in malaria is obtained, larval control is considered a necessary method of control in Northern Transvaal.

Places on the rivers inaccessible on foot could be reached by flat-bottomed boats. This aspect of anti-malaria work will require careful consideration to ensure complete control of vector breeding. The boats cannot reach all breeding places and there will be many difficulties if they have to be carried from one river stretch to another. Their usefulness therefore will be limited.

The application of insecticides by spraying from aircraft has been used successfully in the Union to eradicate tsetse flies and for other purposes. This method might be used to spray larvicides in otherwise inaccessible stretches of rivers, but it is expensive at 4s. 6d. per mile with a swathe of 30 yards. An aircraft certainly covers the mile more rapidly than a labourer with his spray apparatus, but it cannot reach every pool where breeding occurs, especially under trees and high rocks or when wind and weather are unfavourable. In bad weather aircraft may not be able to work at all for weeks at a time. Suitable landing-places also are not freely available.[11] The only drawback with Native labour is their fear of snakes, crocodiles, hippopotami and buffalo, near the larger rivers. In such conditions labourers can be

used in groups, but against these occupational risks they require protection and compensation.

With four-wheel propelled transport it is considered possible to reach most places along the banks of rivers where *A. gambiae* usually breeds, and with Natives to spray the breeding places it is concluded that it is less expensive and more reliable to ulitize hand-spraying methods than aircraft spraying.

Chemoprophylaxis

In the relatively small and well-defined areas where a moderate parasite rate is found it was decided to institute trials with chemoprophylaxis to reduce the parasite rate and the possibility of malaria transmission. Trials were commenced in the winter (July 1957) in order to observe the parasite rate throughout the following malaria season. The prophylactic is not given more frequently than at 4-6 weeks' intervals, because often in the summer season it is not possible to reach these areas more frequently owing to floods and the bad state of the approach roads.

The area chosen for the trial was at the northern end of the game reserve in the triangle between the Limpopo and the Levubu Rivers known as the Pafuri Game Protection Area. (See Tables IV and V and Map 2.). There are some 322 families in an area of over 62 square miles and each house was visited and chloroquine diphosphate (Avlochlor) and pyrimethamine (daraprim) was administered. The dosage of chloroquine base was 600 mg. or 4 tablets per adult of 13 years and over, 300 mg. or 2 tablets for children between 3 and 12 years, and 150 mg. or 1 tablet for children under 3 years. The tablets were administered from 30 July 1957 after thick blood smears had been taken, and the second series of blood smears were taken from 9 September 1957 and the second dose of drug administered. From Table IX it will be seen that the reduction in parasite incidence effected by chloroquine was from 29·6% to 5·3% and by daraprim from 24·1% to 2·4%, and from Table X that of those who were not treated at all 35·1% were found infected.

TABLE IX. MASS ANTI-MALARIA CHEMOPROPHYLACTIC TRIAL WITH (1) CHLOROQUINE DIPHOSPHATE AND (2) PYREMETHAMINE (DARAPRIM): NORTHERN TRANSVAAL, 1957

Before Treatment

Age-group	+ M	+ F	— M	— F	Number Examined	Number Positive
0—11 months	—	—	—	—	—	—
12—23 months	1	—	2	—	3	1
2—4 years	1	—	7	6	14	1
5—9 years	15	5	12	11	43	20
10—14 years	21	6	24	15	66	27
15—19 years	1	2	5	5	13	3
20—39 years	—	3	5	13	21	3
40—59 years	—	—	5	13	18	—
60+	—	—	2	6	8	—
Total	39	16	62	69	186	55 (29·6%)

After Treatment with Chloroquine

Age-group	+ M	+ F	— M	— F	Number Examined	Number Positive
0—11 months	—	—	—	—	—	—
12—23 months	—	—	—	—	—	—
2—4 years	1	—	6	4	11	1
5—9 years	—	—	26	10	36	—
10—14 years	6	—	34	18	58	6
15—19 years	—	1	5	5	11	1
20—39 years	—	—	4	10	14	—
40—59 years	—	—	5	7	12	—
60+	—	—	2	6	8	—
Total	7	1	82	60	150*	8 (5·3%)

Before Treatment

Age-group	+ M	+ F	— M	— F	Number Examined	Number Positive
0—11 months	—	—	—	—	—	—
12—23 months	—	—	1	1	2	—
2—4 years	3	—	4	2	9	3
5—9 years	3	3	2	1	9	6
10—14 years	1	1	—	1	3	2
15—19 years	—	—	—	2	2	—
20—39 years	1	1	3	12	17	2
40—59 years	—	—	2	4	6	—
60+	—	—	2	4	6	—
Total	8	5	14	27	54	13 (24·1%)

After Treatment with Daraprim

Age-group	+ M	+ F	— M	— F	Number Examined	Number Positive
0—11 months	—	—	—	—	—	—
12—23 months	—	—	1	1	2	—
2—4 years	—	—	5	2	7	—
5—9 years	1	—	4	3	8	1
10—14 years	—	—	—	2	2	—
15—19 years	—	—	—	1	1	—
20—39 years	—	—	—	12	12	—
40—59 years	—	—	2	3	5	—
60+	—	—	2	3	5	—
Total	1	—	14	27	42†	1 (2·4%)

* After treatment with choroquine diphosphate.
† After treatment with pyrimethamine (daraprim).

TABLE X. MASS ANTI-MALARIA CHEMOPROPHYLACTIC TRIAL CONTROL: NORTHERN TRANSVAAL, 1957

Without Treatment

Age-group	+ M	+ F	— M	— F	Number Examined	Number Positive
0–11 months	—	—	—	—	—	—
12–23 months	—	3	1	1	5	3
2– 4 years	4	5	3	2	14	9
5– 9 years	3	7	3	3	16	10
10–14 years	—	1	—	2	3	1
15-19 years	—	1	1	2	4	1
20–39 years	—	3	1	11	15	3
40–59 years	—	—	2	11	13	—
60+	—	—	3	4	7	—
Total	7	20	14	36	77	27 (35·1%)

It is proposed to repeat this prophylactic treatment, mainly with chloroquine because daraprim is suspected of creating a drug resistance in the malaria parasite and as so many tourists use daraprim as a prophylactic it is probably wise to limit mass chemoprophylaxis to drugs that are not suspected of generating parasite resistance. It may also possibly be more poisonous because it is tasteless, whereas chloroquine, being very bitter, is unlikely to be taken freely in poisonous doses.

It is interesting to note from Table IX that males predominated amongst the infected in the mass chemoprophylactic trial and from Table X that females predominated amongst those who omitted to obtain treatment at the first trial. No satisfactory explanation for this population distribution is yet available. *P. falciparum* was the only parasite encountered in this series.

Cost of Malaria Control

It is estimated that the expenditure on malaria control during the 1955-56 season was £145,000 in order to protect an estimated population of over 1,450,000. A more accurate method of accounting has since been adopted. Investigations

are in hand into the quality of the insecticide, the various formulations, dosages and methods of application

Endemiology

According to the definition of the Expert Malaria Committee of the WHO, malaria in the Northern Transvaal can now be described as hypo-endemic because the spleen rate in children under 9 years of age is under 10%. From the parasite rate (Table II) it would appear that the incidence is greatest along the eastern and north-eastern borders of our territory. Between Komatipoort and Pafuri the Game Reserve forms a buffer zone where little spread of the disease can occur because of its limited human population. It is on the other hand a nature reserve where vector control measures are not normally carried out except against vector larvae near the large tourist camps and against adult vectors immediately before the winter tourist season starts. It might therefore form a focus of vector propagation which must be watched carefully.

The annual occurrence of malaria in the northern and eastern boundary areas shows that the potential endemicity there is high and unless continuous surveillance is practised malaria may spread to become epidemic there, as well as in the western areas where vectors can propagate rapidly, as experience has shown in the past.

Of the factors that play a dominant role in endemicity the human carrier, the parasite and the vector have been discussed briefly. Human carriers exist in the Northern Transvaal and immigrant Natives may also import the parasite which infects the local vectors. A non-immune population is building up in the Northern Transvaal through immigration from other parts of the Union because of the economic opportunities in the Northern Transvaal afforded for example, by fruit, vegetable and cattle farming, the mining and timber industry, and canning and other secondary industries. The environment is suitable for the rapid propagation of the vector and the climate is so warm that the human element is much inclined to neglect personal precautionary measures. The general public accept it as a fact that malaria has been eradicated and acts accordingly. They also rely on drugs like camoquin (amodiaquine), and chloroquine (aralen, resochin) to cure malaria immediately. Others take these drugs as a preventive because they find it less troublesome and less expensive than to use bed nets, screen houses and take other such active measures. The chief reliance must therefore, from the public-health point of view, be placed on vector control and parasite eradication.

DISCUSSION

The various problems that require solution must now be discussed.

Statistics. It is necessary to ensure a more accurate recording of the number of cases of malaria and their thorough treatment and investigation in both Europeans and non-Europeans in malarious areas. At present there is a close liaison between hospitals, medical practitioners and the malaria staff in the Northern Transvaal so that most cases that apply for medical treatment are recorded. It is, however, felt that still greater accuracy is needed and for this purpose malaria was made a notifiable disease in 1956. There is now a statutory obligation on every medical practitioner, as well as tribal authorities as prescribed in sections 19 and 20 of the Public Health Act, to report every case of malaria, including cases of intermittent fever. There are at most a few hundred cases that would require notification. A prerequisite is the taking of blood smears from all suspected cases. The thorough treatment of all actual and suspected cases and a thorough investigation of the source of the infection is essential in order to eradicate the parasite.

Legislation. Existing legislation prohibits the creation of conditions which will facilitate the propagation of the vector mosquito. The application of this measure may initially be unpopular because it would require that farmers must ensure that irrigation water is so used that the water-table is not raised to an extent where puddle and pool formation occurs. It is necessary for farmers to cement-line all irrigation canals and channels to prevent seepage. If such a measure were enforced it would not only affect mosquito breeding but it would incidentally limit snail breeding and thus influence the incidence of bilharzia, as well as save large areas of land from becoming marshy and unsuitable for agricultural purposes. The enforcement of this measure is needed as urgently for the sake of agriculture and water supplies as of health. The increase in land values through closer settlement in itself already necessitates the control of irrigation water, in the eastern and northern areas of Northern Transvaal. The application of the existing regulations, enforced if necessary by prosecution, would soon induce farmers to adopt water conservation as a standard practice. It would save the malaria organization staff from dissipation of its time and energies on numerous over-irrigated farms and enable it to devote itself to vector control in the many natural water courses in the endemic areas.

Immigration of human parasite carriers into a territory where malaria is under control may result in the reintroduction of the disease and consequent spread to the indigenous population. Measures for the control of such carriers at international boundaries or for their treatment there with drugs for the eradication of gametocytes appears to be warranted. Concerted anti-malarial action by the governments concerned on both sides of the international boundary would offer the best means of preventing spread of the disease in this way.[13]

Importation of Vectors occurs relatively easily in two chief ways, viz. (1) by railway and especially motor transport, and (2) by aerial convection. Outbreaks of vector breeding and certain outbreaks of malaria could be explained only by assuming that infected females were transported to the particular locality by road motor or rail transport. It seems rather paradoxical that the few aircraft that enter the Union are sprayed to prevent the introduction of mosquitoes whereas the large volume of road traffic enters the Northern Transvaal from west, north and east without any attempt being made to prevent the importation of mosquitoes and other insect pests. If Brazil was subject to the importation of *A. gambiae* by aircraft then many areas in Africa must have been subject to similar transference of *A. gambiae* from one area to another by surface transport. Aerial convection may also play a part in so far as the prevailing winds may drive vectors from the eastern and north-eastern vector breeding areas on the Limpopo, Olifants and Crocodile rivers to the western areas and may account for the delay in the clearance of those areas of vectors. It is neces-

sary therefore to obtain close interterritorial cooperation where common boundaries exist.

CONTROL MEASURES

Control measures against the vector have been intensified by larviciding in the early spring in the areas along the Limpopo and its tributaries—the winter nurseries from where the vector is known to start spreading every year to other areas—when the water in the rivers is at its lowest and pools are dried up. This formidable task would be simplified by cooperative action on both sides of the rivers which form interterritorial boundaries. Where the overland approach to breeding places is difficult, spraying of larvicide from the air is unlikely to receive consideration because of the cost and the doubtful effectiveness of this procedure and because of the probable success of chemotherapeutic control.

Control measures by larviciding along the other large rivers in the eastern Transvaal, viz. the Komati, Crocodile and Olifants Rivers, would be slightly easier because they can be approached on both sides down to the border.

DDT emulsion is the larvicide of choice and so far there is no indication that resistance to DDT is a real danger.

Agricultural Practices

Agricultural practices play an important role in malaria control. Now that fertile areas have been cleared of the malaria danger new agricultral undertakings are started in a favourable semi-tropical climate. Owing to the abundance of water, irrigation schemes are begun without adequate planning and capital. Rivers and streams are dammed up and because the irrigation canals are not lined with cement, numerous seepage pools occur. Furthermore, planting of paddy rice is practiced in certain areas in a manner that favours the breeding of *A. gambiae* as well as other anophelines. Not only does this problem require that the existing malaria regulations should be strictly adhered to but all canals and furrows ought to be cement lined as well as strict control kept over water supplies. This anti-malaria measure would incidentally help to combat the snail and bilharzia problems. Farmers growing rice as food for themselves should be adequately instructed in the making of paddy fields. Rice, can, however, not be produced in the Northern Transvaal in competition with other areas in Africa and Asia. The growing of rice for gain could be stopped by the free importation of rice from elsewhere and the competition would discourage local production. On the other hand rice production in the Union could be protected by high import-tariffs and conditions for the growing of paddy rice prescribed which would eliminate the risks of mosquito and snail breeding. The higher price of rice would enable the farmer to comply with such requirements. A proposal has also been made that rice should be declared a luxury article and its importation totally prohibited. If that were done the local demand would cause the price for rice to rise to a level where the farmer could produce it economically as well as comply with the prescribed methods for rice production without at the same time causing malaria or bilharzia. The present production methods threaten to bring back malaria where it has been eliminated. It is, however, doubtful whether the limited area of soil suitable for agriculture in the Union should be utilized for such a soil-exhausting crop as rice. Whatever official action is to be taken it is clear that the matter will have to be brought to the notice of the individual rice grower.[14]

Land settlement is a problem because non-immune people are being transferred to malaria-endemic areas with the result that they succumb to malarial attacks much more readily than old residents. The problem is aggravated by the fact that, for a considerable period after arrival in the endemic areas, the new settlers are financially unable to provide themselves with suitable housing accommodation and protection against the vector mosquitoes. The solution to this problem may be to ensure (1) that the settler is provided with funds or facilities to build a house as soon as he arrives, (2) that he is allowed to arrive only at the end of the malaria season, (3) that he observes personal precautions, and (4) that he is provided with suppressive drugs regularly during the first few malaria seasons after his arrival.

International Cooperation

It is clear from past experience in the Northern Transvaal as well as in other countries that international cooperation is an essential requirement if the ideal of malaria eradication is to be attained.

If the evidence that malaria in the Northern Transvaal is under adequate control is accepted, then the next step is to proceed to malaria eradication; and if the experience of other member countries of the WHO is a reliable guide to the methods to be adopted then interterritorial cooperation is essential and the control measures of the various territories must be coordinated. Field staffs should meet frequently and information and views on all aspects of malaria incidence and methods of control be freely exchanged. Interterritorial conferences should also be held regularly to review the past and plan for the future, at which the experience of the WHO should be available.

CONCLUSION

Tables and maps are presented which provide reliable malariometric indices from which it can be concluded that malaria has been reduced to an almost negligible figure as compared both with its former epidemic occurrence and with the incidence of other communicable diseases in the Northern Transvaal.

If malaria is to be eradicated in the Northern Transvaal certain foci along the Limpopo and its tributaries as well as along the Olifants, Sabie, Crocodile and Komati Rivers must be eliminated or limited by more intensive residual spraying and by late winter and early summer larvicidal measures. Mass chemoprophylactic measures will be of great assistance in reducing malaria transmission in those areas where the parasite rate is still relatively high.

If the urgency of the need for malaria eradication on account of the threat of vector and parasite resistance, as indicated by the WHO is admitted, interterritorial cooperation and integration of anti-malaria programmes should be put into operation immediately.

SUMMARY

1. Measures to reduce the incidence of malaria in the Northern Transvaal have been in operation since 1930.

2. Since 1946 more intensive control was effected by using DDT and later BHC while the malaria control staff was also expanded. It is considered that well over 80% of the popu-

lation at risk 10 years ago are now free of risk from malaria.

3. The distribution of malaria cases and of parasite carriers discovered by taking a large number of blood smears shows that slight transmission still occurs along the eastern border of the Transvaal, especially near the Limpopo and Komati rivers and chemoprophylaxis may lead to final eradication of the disease.

4. Vectors occur in the Limpopo River during winter and spreads up the tributaries. Residual spraying has, however, ceased over the north-western parts because of the absence of parasite incidence.

5. Only close cooperation with adjoining territories will make final eradication of malaria in the remaining malaria foci in Northern Transvaal feasible, in conjunction with mass chemotherapy where the parasite rate is found to be high.

6. Measures to achieve this ideal are in hand.

My thanks are due to the Secretary for Health for permission to publish and to the malaria staff for their interest and enthusiasm in the work. Dr. H. P. Botha and the technical assistants F. J. Erasmus and A. J. Coetzer deserve special mention. Acknowledgment is made to all hospitals, medical officers and district surgeons who have assisted in providing information for this paper.

DISSEMINATED LUPUS ERYTHEMATOSUS PRESENTING AS IDIOPATHIC THROMBOCYTOPENIC PURPURA

G. B. LAPINSKY, M.B., B.CH., *National Hospital, Bloemfontein*

A. T. NESER, B.SC., M.B., CH.B., *South African Institute for Medical Research, Bloemfontein*

Since the discovery of the L.E. phenomenon by Hargreaves[1] in 1948 the concept of disseminated lupus erythematosus (DLE) as an immunological disease has been gaining ground.

False positive serological tests for syphilis in this disease have been recognized for many years. Lately there have been a number of reports both overseas and here in South Africa[2] of haemolytic anaemia associated with DLE. There have also been reports of a haemorrhagic tendency with thrombocytopenia and/or a circulating anticoagulant complicating or preceding the disease.

Eversole[3] reported 6 cases of DLE presenting as thrombocytopenic purpura where the correct diagnosis of DLE was only made on post-mortem examination or after splenectomy. He states that splenectomy does not exert a harmful influence on this disease. Swift[4] reported 2 cases with thrombocytopenia and/or a circulating anticoagulant where the prothrombin concentration at no stage exceeded 57%. He considered the circulating anticoagulant to be an antithromboplastin produced by an auto-immunological response to thromboplastin released by the breakdown of platelets. Frick[5] reported 3 cases in whom the presence of a circulating anti-coagulant, ++++ cephalin-cholesterol flocculation, and false positive serological tests for syphilis, were common features.

There are a number of other reports of similar cases seeming to mark this disease as one in which protein metabolism is markedly affected.

CASE REPORT

The patient, a 16-year-old European schoolgirl, was admitted to the gynaecological ward on 18 January 1957 for vaginal bleeding. Her last normal menstrual period had been towards the end of November 1956. Since 5 January she had been bleeding continuously. Apart from the vaginal bleeding, she showed marked pallor and a bruise over the sacral area. Erythrocytes 2,200,000 per c.mm. Leucocytes 13,200 per c.mm. Platelets normal in number and morphology. Corrected sedimentation rate (Wintrobe) 7 mm. Her condition was regarded as being an incomplete abortion, and 6 pints of whole blood were transfused and a dilatation and curettage performed. She was discharged from hospital on 28 January, apparently well.

On 12 February 1957 she was admitted to the surgical unit as a case of acute appendicitis. Owing to concurrent epistaxis and a few petechial haemorrhages on her ankles she was transferred to a medical ward. On enquiry it was stated that she had suffered numerous nose-bleeds during the past 3 months and that she had bruised very easily during this period, but no history of a familial bleeding tendency could be elicited. She denied having used any drugs. Examination showed tenderness and guarding over the right iliac fossa. There was slight bleeding from the nose and vagina. Old purpuric haemorrhages were visible over the ankles. The Rumpel-Leede sign was markedly positive.

The laboratory findings at this stage were as follows: Bleeding time 22 minutes. Coagulation time 21 minutes. Urine, nothing abnormal. Haemoglobin, 8·8 g.%. Erythrocytes 3,200,000 per c.mm. Leucocytes 4,800 per c.mm. Platelets less than 1,000 per c.mm. Prothrombin concentration 51%. Corrected sedimentation rate 33 mm. Blood urea 36 mg.%. Total serum protein 5·8 g.% (albumin 3·8, globulin 2·0). The Eagle test and the V.D.R.L. tests were positive. Blood samples were forwarded to the S.A.I.M.R., Johannesburg, for examination and Dr. H. B. W. Greig reported as follows: 'Prothrombin time (single stage) greater than 120 seconds (normal 13·6 seconds). This was corrected to 28 seconds by the addition of normal serum. The thromboplastin regeneration test showed a defect in both serum and plasma components. The patient's plasma did not correct plasma from a case of haemophilia and her serum did not correct a known case of Christmas disease. An inhibitor of thromboplastin generation could be detected in the patient's plasma after alumina treatment but not in the patient's serum.' Dr. Greig commented as follows: 'These findings suggest an inhibitor but to what extent the abnormality found in the plasma may be due to the age of the plasma is not known. The serum defect appears to be complex; it results in an abnormal prothrombin time, suggesting a factor VII or X deficiency, and abnormal thromboplastin generation, suggesting a Christmas factor defect. There seem to be so many defects in the patient's clotting mechanism that it is difficult to give a diagnosis. Further samples of both serum and plasma would be welcomed.'

During the next fortnight profuse vaginal bleeding took place, necessitating the administration of 24 pints of fresh blood. The blood was given by 'cut downs' because 'push ins' were not found possible. ACTH was given by intramuscular injection, and penicillin in full doses because the Eagle test remained positive. The platelet count remained negligible and there was no improvement.

In desperation protamine sulphate and vitamin K1 was given by injection, and the ACTH was replaced by oral prednisone; within 48 hours bleeding stopped and it has not been necessary to administer blood since. The Rumpel-Leede sign became negative and the platelet count rose to 90,000 per c.mm. At this stage a specimen of sternal marrow was examined; megakaryocytes were present in adequate numbers. She was discharged on a maintenance dose of prednisone on 23 March, to return for splenectomy should the remission not be sustained, the diagnosis at this stage being 'thrombocytopenic purpura'.

She was readmitted for splenectomy on 10 April 1957. The platelet count had remained around the 40,000 per c.mm. mark during her stay at home. A normal menstrual period occurred during her first 5 days in hospital. Prednisone was slowly with-

drawn and completely stopped on 19 April. She then developed a swinging temperature and burning on micturition. Penicillin was given from 3 May, but as the temperature persisted splenectomy could not be performed.

On 7 May her temperature rose to 103·4° F and she developed a butterfly erythema on her face; the penicillin was discontinued. A diagnosis of DLE was made and confirmed by the finding of LE cells by means of a modification of the technique described by Snapper[7] in which a substrate of normal or lymphatic leukaemic blood is prepared by filling a plastic ring 1 cm. in diameter on a slide with freshly obtained blood. After incubation at 37° C in a water bath the clot and ring was slid off. A plastic ring was now placed over a portion of the prepared substrate and filled with the patient's fresh blood. This was then incubated for 2 hours as before. The results obtained were as follows:

Lymphatic leukaemic substrate, 212 LE cells per 500 leucocytes.

Normal blood substrate, 20 LE cells per 500 leucocytes.

Two-hour clot method, 5 LE cells per 500 leucocytes.

Prednisone was again administered orally and dramatic improvement followed. The rash disappeared and the temperature subsided within 72 hours. The other laboratory findings at this stage were as follows: Haemoglobin 10·8 g.%. Erythrocytes 3,700,000 per c.mm. Leucocytes 6,300 per c.mm. Platelets 80,000 per c.mm. Corrected sedimentation rate (Wintrobe) 14 mm. C-reactive protein absent. Cephalin cholesterol flocculation test +++. Total serum protein 6·5 g.% (globulin 3·0, albumin 3·5). Blood urea 43 mg.%. Eagle test positive. Direct Coombs test positive.

During the subsequent weeks the patient developed a 'moon-face' and generalized swelling of the body without any pitting oedema. She was discharged from hospital on 27 May still taking prednisone by mouth.

On 7 June 1957 she was readmitted to hospital in a comatose state with associated Jacksonian-type fits. Generalized oedema was present. Her temperature was 101·6° F and her blood pressure 160/90 mm. Hg. Lumbar puncture yielded clear fluid under a pressure of 270 mm. water with a protein content of 200 mg.%. The urine contained 4·6 g. of albumen per litre; pus cells, granular casts and hyaline casts were present. Haemoglobin 9·7 g.%. Leucocytes 10,600 per c.mm. (polymorphs 83% with a marked shift to the left). Platelets 56,000 per c.mm. Total serum protein 4·6 g.% (albumin 2·9, Globulin 1·7); sodium 366 mg.%, potassium 17·2 mg.%, chlorides 635 mg.% (as NaCl).

Intramuscular ACTH was substituted for prednisone but only slight improvement ensued; the patient remained semi-comatose for the week that followed. On 17 June she developed right-sided fits which could not be controlled by sedation. After 3 hours 80 c.c. of triple-concentrated plasma was administered intravenously; within 6 minutes the fits ceased and she returned to consciousness, and within an hour coherent speech was possible. She received further triple-concentrated plasma during the days that followed. Lumbar puncture was performed again the day after her recovery and showed no abnormality whatever. From her urine a B. coli, sensitive to chloromycetin, was cultured. After this antibiotic had been administered for a short period the leucocytosis and the shift to the left was no longer present. However, she remained oedematous and lethargic until the ACTH was replaced by oral prednisone; thereafter improvement was rapid and she could be discharged from hospital on 22 July on a maintenance dose of prednisone.

She remained well until February 1958, when she developed pyelocystitis and was again admitted. The B. coli infection responded again to chloromycetin. Laboratory examinations revealed a persistent massive albuminuria varying from 6 to 13 g. per litre. Her platelet count had dropped to 17,000 per c.mm. The Eagle test and the direct Coombs test were negative. Cephalin-cholesterol flocculation test +. The LE-cell test was also negative. She was discharged on a maintenance dose of prednisone on 6 March, feeling perfectly well.

DISCUSSION

The development of the L.E. cell in *in vitro* preparations is to some extent dependent on the coagulation of blood, the process of coagulation acting as a potentiating agent.[8] In a purely speculative discussion Hargreaves[9] mentions 45 cases of DLE where the platelet count was above 50,000 per c.mm. In these cases bleeding was not a feature of the disease and the LE-cell test was positive. However, in 3 cases with thrombocytopenia the LE-cell test was negative and the true nature of the disease only became evident after splenectomy had been performed and the LE test became positive. It is therefore conceivable that in the case described here the prednisone had the effect of raising the platelets to a sufficiently high level to allow the symptoms and signs of DLE to become prominent 2 weeks after withdrawal of the prednisone, thus paralleling Hargreaves' case where splenectomy had been performed.

Another point arising from the above cases is that the circulating anticoagulant and/or the thrombocytopenia may interfere with demonstration of the LE-cell phenomenon by the clot methods.

The last point of note in the case described here is that the patient presented all the protein disturbances that have been reported to date, viz. (1) positive LE-cell phenomenon, (2) false positive serological tests for syphilis, (3) positive direct Coombs test, (4) circulating anticoagulant and thrombocytopenia, and (5) positive cephalin-cholesterol flocculation test.

The convulsive incident might have been due to overdosage with prednisone. On the other hand it might have been due to the renal involvement or to the DLE *per se*. Clark and Bailey[10] report 28 cases of DLE with neurological or psychiatric disturbances, of which 14 had convulsions.

SUMMARY

A case of acute disseminated lupus erythematosus presenting as thrombocytopenic purpura is described. All the previously published protein disturbances could be demonstrated in this patient. The possible relationship between the symptomatology of the disease, the LE-cell phenomenon, and the blood platelet level, is discussed.

We wish to thank Drs. C. D. Brink, D. J. J. Bezuidenhout and F. P. Scott for their encouragement and advice; also Dr. J. W. Wessels, Superintendent of the National Hospital, Bloemfontein, for permission to publish.

REFERENCES

1. Hargreaves, M. M., Richmond, H. and Morton, R. (1948): Proc. Mayo Clin., **23**, 25.
2. Grobbelaar, B. G. (1956): S. Afr. Med. J., **50**, 1029.
3. Eversole, S. L. (1955): Bull. Johns Hopk. Hosp., **96**, 210.
4. Swift, S. (1956): A.M.A. Arch. Derm., **74**, 296.
5. Frick, Paul G. (1955): Blood, **10**, 69.
6. Lee, S. L. (1956): A.M.A. Arch. Derm., **73**, 313.
7. Snapper, I. and Nathan, D. J. (1955): Blood, **10**, 718.
8. Zimmer, F. E. and Hargreaves, M. M. (1952): Proc. Mayo Clin., **22**, 424.
9. Hargreaves, M. M. (1952): *Ibid.*, **22**, 419.
10. Clark, E. C. and Bailey, A. A. (1956): J. Amer. Med. Assoc., **160**, 455.

Radiation Protection in Industry. During July 1958 the International Labour Organization (ILO) held a European Regional Training Course on Radiation Protection in Industry. The UK Government offered host facilities, and the course was held in Lincoln College, Oxford, and the UK Atomic Energy Research Establishment at Harwell. A reception to those taking part was given in London by the UK Minister of Labour and National Service.

CANCER CURER'S CASE BOOK: 1

EPITHELIOMA OF THE LIP

J. D. ANDERSON, M.B., B.CH. (RAND), *Registrar, Radiotherapy Department, Groote Schuur Hospital, Cape Town*
From the Combined Clinic, Groote Schuur Hospital

Once a patient has received treatment for a local lesion with escharotic cancer pastes, we find that radiotherapy as well as surgery lose their effectiveness and control of the disease is almost impossible. The use of escharotic pastes by 'cancer curers' leads to much deformity and great misery and deprives the patient of whatever chance he had of obtaining a permanent cure.

A European farmer aged 44 noticed a small lump on the right side of his lower lip in 1942. He obtained some 'cancer paste' (*kankerpleister*) from a 'cancer curer' which he applied to the lip. The lesion ulcerated and became steadily bigger. He consulted his family doctor, who told him that the lesion was precancerous, and referred him to the Radiotherapy Department of Groote Schuur Hospital for treatment.

He was first seen at the Radiotherapy Out-patient Department on 24 January 1944, when he was 46 years old, and it was noted that 'he had an ulcer of the right side of the lower lip, with extensive scarring due to the use of the "cancer paste" . . . . there was no secondary lymph-node involvement'. He also had infected teeth, which were extracted the following day, when a biopsy of the ulcer was taken, in which on histological examination hyalinization of the collagen fibres and some amyloid features were seen but no evidence of malignancy was found.

As the lesion was obviously infected, and because of the danger of over-reaction to irradiation, small anti-inflammatory doses of X-rays (120 kv. with a 3 mm. aluminium filter over an area of 6×8 cm.) were applied, 450 r being given over a period of 3 weeks. The lesion grew smaller, and the patient was asked to return in 3 months for reassessment.

He was not seen again for almost 2 years when, in January 1946, a similar picture, somewhat more advanced, presented itself. He again received a course of anti-inflammatory X-ray therapy, this time being given 600 r over 4 weeks and his condition was reassessed at the end, when surgery was advised. He emphatically refused surgery and went home, with the lesion much improved. He was not seen again until 1951—almost 5 years later.

At home the lesion started enlarging, and the patient again went to see the 'cancer curer', who gave him more of the 'cancer paste', which he was told to apply to the lip every 12 hours. This he diligently did for the next 5 years, during which time he noticed that the lesion was steadily increasing in size, and on 31 January 1951 he came back to Groote Schuur Hospital for further treatment.

It was then noted that he had an extensive squamous carcinoma of the lip, with a long linear scar running from the right angle of the mouth, down the neck, and ending in an infected ulcer over the right hypochondrium (Fig. 1). This long linear scar was caused by the use of the 'cancer paste' and its running down over the chin, neck and thorax, presumably associated with a constant dribble of saliva down this scarred area.

On 6 February 1951 an extensive resection was carried out by Mr. T. Schrire, when part of the upper lip, the anterior half of the mandible, the floor of the mouth, and the lower lip well beyond the growth, were excised, with a clearance of the lymph nodes of both anterior triangles of the neck, and a removal of the scar tissue and the infected ulcer over the abdomen as well. Macroscopically the line of excision appeared to be well clear of the growth. A tracheotomy was done, and a closure of the gap attempted, leaving a raw area, rectangular in shape at the base of the neck.

Histologically, the tumour, a markedly keratinized squamous carcinoma, was seen to have invaded the mandible, and a submandibular lymph gland was also affected. Although macroscopically the line of excision was well clear of the lesion, it was seen microscopically at one point in the submental region to have passed through the tumour.

Two weeks later the patient was declared fit for the commencement of the plastic repair of the defect. This consisted of 9 separate operations extending over a period of 10 months, and after one of these he developed an acute parotitis, for which he received 500 r of medium-voltage X-ray therapy.

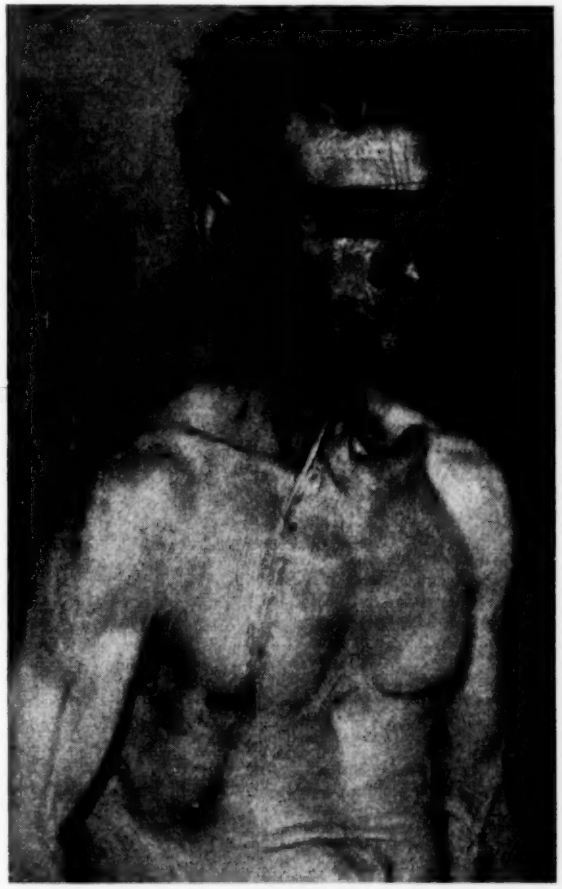

Fig. 1.

When he was readmitted for further plastic repair to his jaw, it was noted that he had a recurrence below the left side of the mandible. X-rays revealed erosion of the stump of the mandible. When the infection had finally subsided after 3 or 4 months, an exploration was done of the right maxilla and infratemporal region, with a view to maxillectomy, as the maxilla had become involved, but the lesion was found to be inoperable.

After this, the course of his illness was a steady downhill one, and a year later, in July 1953, he was found to be very much worse and was admitted for a leucotomy to relieve his pain. He died 2 days after the leucotomy.

SUMMARY

1. A case of premalignant lesion of the lip treated by a 'cancer curer' with escharotic is recorded.

2. Carcinoma developed and proved resistant both to radiotherapy and to very extensive surgery.

IN MEMORIAM

J. S. DU TOIT, M.D., F.R.C.S. (EDIN.)

It is with deep regret that we refer to the sudden death of Dr. Jacobus Stephanus du Toit, which took place at his home in Cape Town on Sunday, 3 August 1958. Dr. du Toit, who was in his 73rd year, became indisposed a few days before; he developed a severe heart attack at 1 a.m. on Sunday and died 18 hours later.

Dr. du Toit's death is a serious loss to the medical profession and the Medical Association, and will also be felt in many other walks of life. He had been a member of the Association for 46 years, and became its President in 1956, when he resigned the office of Hon. Treasurer of the Association, which he had held for 32 years. He was President of the Cape Western Branch in 1929, and had for many years served as Hon. Treasurer of the Branch. Dr. du Toit has attended meetings of Federal Council ever since the Council was established. He was also a member of the Executive Committee of Federal Council and the Head Office and Journal Committee. In 1952 he was awarded the Gold Medal of the Association for distinguished services to the medical profession and the Association.

From 1916 Dr. du Toit practised as an ophthalmic surgeon in private practice in Cape Town. He established an ophthalmic clinic at the Cape Town Free Dispensary and joined the staff of the Somerset Hospital, which was later transferred to Groote Schuur Hospital. From 1937 to 1949 he served jointly with Dr. A. W. S. Sichel as head of the department of ophthalmology at the hospital and joint senior lecturer in this subject at the University. For 21 years he served the School for the Blind at Worcester, C.P.

Dr. du Toit was a member of the Council of the University of Cape Town (32 years), elder (22 years) and chairman of the Finance Committee of Groote Kerk, Cape Town, and director of the Nasionale Pers Beperk (25 years). For many years he was interested in farming and owned a farm at Durbanville, Cape. He was interested also in sport and played rugby during his student days.

Du Toit was born at Worcester, Cape, and educated at the Worcester Boys' High School and at French Hoek. He was a student at Victoria College, Stellenbosch, and graduated in medicine at Edinburgh, where he qualified in 1912, proceeded M.D. in 1914, and took his F.R C.S. (Edin.) in 1915. For 4 years he undertook postgraduate work at London in ophthalmology and neurology.

In 1916 he married Miss Emmeline J. Steyn, youngest daughter of the late President M. T. Steyn of the Free State. To Mrs. du Toit and their 3 daughters (their only son died in 1935) we offer our deepest sympathy in their great loss.

Appreciations will be published in a future issue.

HONORARY TREASURER'S SPECIAL FUND : ERE-PENNINGMEESTER SE SPESIALE FONDS

The following donations are gratefully acknowledged: Met hartlike dank word die volgende skenkings erken:

	£	s.	d.
Previously acknowledged/Voorheen erken ..	578	7	0
Dr. P. C. W. Madden, Cape Town	5	5	0
Dr. R. L. Tobias, Cape Town	3	3	0
Dr. P. S. Jenkin, Rondebosch	3	3	0
Dr. D. Anderson, Grahamstown	3	3	0
Dr. C. F. Marais, Bloemfontein	5	0	0
Dr. M. Helman, Cape Town	5	5	0
Dr. M. J. Goddefroy, Bloemfontein	4	4	0
Dr. J. P. C. Bester, Worcester	2	2	0
Dr. E. W. Turton, Boksburg Noord	10	0	0
Dr. R. McDonald, Kenilworth, C.P.	10	10	0
Dr. S. N. Swirsky, Observatory, Johannesburg ..	10	10	0
Dr. S. J. Zwiegelaar, Venterstad	6	6	0
Dr. M. R. Gitlin, Durban	2	2	0
Dr. E. Cahl, Wesselsbron	5	0	0
Dr. R. C. B. MacRae, Port Elizabeth	2	2	0
Dr. F. A. Balzun, Komatipoort	5	0	0
Dr. H. Renton, Durban	10	10	0
Dr. R. D. Kidd, Pietermaritzburg	5	5	0
Dr. H. Gottschalk, Wynberg, C.P.	2	2	0
Dr. I. Sherman, Johannesburg	2	2	0
The late Dr. J. S. du Toit, Kaapstad	5	2	0
Dr. G. B. Lapinsky, Durban	1	19	0
Dr. T. R. Wooldridge, Tsomo	3	3	0
Dr. W. J. Perkins, Camperdown	5	5	0
Dr. R. L. H. Townsend, Cape Town	2	2	0
Dr. R. F. Maggs, Cape Town	2	2	0
Anonymous, C.P.	5	0	0
Anonymous, Rondebosch	2	2	0
Drs. Feldman, Jeppe and Frankel, Rosebank, Jhb.	10	10	0
Dr. H. Park Forster, Forest Town, Johannesburg ..	5	5	0
Dr. J. H. Struthers, Pretoria	5	0	0
Dr. J. H. L. Shapiro, Cape Town	5	0	0
Dr. H. Aneck-Hahn, Pretoria	2	2	0
Dr. B. Epstein, Pretoria	3	3	0
Dr. Beck de Villiers, Bloemfontein	3	3	0
Dr. R. Lance Impey, Claremont	1	1	0
Dr. J. K. de Kock, Kaapstad	5	0	0
Mr. S. Scher, Cape Town	2	2	0
Dr. F. Sutton Charnock, Observatory, C.P. ..	2	2	0
Dr. C. G. Hamilton, Randfontein	2	2	0
Dr. G. Sacks, Cape Town	5	5	0
Total as at 31 July 1958	£759	11	0
Totaal op 31 Julie 1958.			

PASSING EVENTS : IN DIE VERBYGAAN

Mr. Len Stein, B.Sc., M.B., F.R.C.S. (Edin.), Surgeon, Baragwanath Hospital, Johannesburg, has recently returned from an extended visit overseas where he worked in vascular surgical units in Britain and America.

Mnr. Len Stein, B.Sc., M.B., F.R.C.S. (Edin.), Chirurg, Baragwanath-Hospitaal, Johannesburg, het onlangs teruggekom van 'n uitgebreide reis oorsee, waar hy in chirurgiese bloedvaateenhede in Engeland en Amerika gewerk het.

* * *

Research Forum, University of Cape Town. A joint meeting will be held with the South African Cardiac Society on Wednesday 13 August at 12 noon in the large A-floor lecture theatre, Groote Schuur Hospital, Cape Town. Subjects: (1) 'Fallot's Tetralogy and Pulmonary Stenosis, pre- and post-operative assessment of severity by auscultation' (Drs. L. Vogelpoel and V. Schrire), and (2) 'Value of amyl nitrite in differentiation of Fallot's Tetralogy from Pulmonary and Infundibular Stenosis with intact ventricular septum' (Drs. L. Vogelpoel, V. Schrire, M. Nellen and A. Swanepoel).

* * *

Radiotherapy Film. Westdene Products (Pty.) Ltd. have added to their library a new film '100 Million Electron Volts against Cancer' (Dr. A. Wander), which will be issued on loan on application to their Public Relations Department, P.O. Box 7710, Johannesburg. The film deals with the radiotherapy of cancer and its main purpose is to show the most recent advances made in this field. The working methods and applications of the X-ray generators, from the simple roentgen tube to the betraton, are reviewed and explained by means of trick drawings and selected examples. The pictures of cell division of normal tissues and of tissues damaged by radiation, taken by time-lapse photography, deserve special mention. The film is in black and white, 16 mm. sound, and runs for 45 minutes. It will be of interest to all medical practitioners.

Dr. J. T. Hayward-Butt, M.A., B.Chir. (Cantab), F.F.A.R.C.S., D.A., Senior Lecturer in Anaesthetics at the Medical Faculty of the University of Natal, is proceeding overseas to take up his appointment as Assistant Professor of Anaesthesiology at the State University of Iowa, Iowa City, USA. As a consequence, he will be withdrawing from private practice.

He has been invited by the Society of Anaesthesiologists of Italy to read a paper at the International Congress, on Relaxants, at Venice, and to sit on the curare mortality panel. Following visits to centres in Switzerland, France, Belgium and the UK, he will undertake a short lecture tour of the East Coast of North America and Canada before taking up his duties.

* * *

A Pneumoconiosis Conference, sponsored by the South African Council for Scientific and Industrial Research, will be held in Johannesburg from 9-24 February 1959. The conference is intended to bring together persons representative of the several scientific disciplines concerned in the study of pneumoconiosis, to discuss recently acquired knowledge and to recommend subjects in which further research is important and likely to be rewarding.

The participants in the Conference will be *members*, invited by the authority of the South African Council for Scientific and Industrial Research, and other interested persons as *observers*. Observers will be able to participate in discussions by invitation of the chairman of the session.

The President is Prof. F. S. Oosthuizen and the Secretary-General is Dr. A. J. Orenstein. Further information can be obtained from Dr. A. J. Orenstein, P.O. Box 4788, Johannesburg.

* * *

The Mecca Pilgrimage, which ended on 30 June 1958 and was attended by more than half a million Moslem pilgrims from 34 nations, was again successfully kept free from pestilential disease. Last year the 1957 pilgrimage was also free from any contagious disease except some imported cases of Asian influenza. In the past the Mecca pilgrimage was often marked by the spread of epidemic diseases on a large scale, particularly plague, cholera and smallpox, and has played a sinister part in the pandemic spread of these diseases. The freedom from infection during the 1958 pilgrimage, notwithstanding the recent outbreaks of smallpox and cholera, particularly in India, Eastern Pakistan and Thailand, is largely the result of modern prophylactic measures taken by the Government of Saudi Arabia and cooperative measures on the part of health authorities of the home countries from which the pilgrims proceeded. The success of these measures is all the more noteworthy in view of the conditions obtaining amongst the pilgrims during the pilgrimage.

* * *

Dr. Maxwell M. Wintrobe of Salt Lake City, Utah, USA, Professor of Medicine, University of Utah, who is visiting South Africa *en route* to the International Haematological Congress to be held in Rome in September, is due to arrive in Johannesburg by air on 7 August approximately. He will visit Cape Town, when he will address the Medical Faculty of the University on 'The Spleen, Splenomegaly and Splenectomy' and the Cape Western Branch of the Medical Association of South Africa on 'Principles in the Management of Anaemia'. The dates and places of these meetings will be announced later. All medical practitioners will be welcome, and those who desire to hear Professor Wintrobe, who is an international authority on haematology, are advised to enquire of the Dean of the Faculty of Medicine (5-4220) or the Secretary of the Cape Western Branch (3-1574) for particulars concerning the lectures in Cape Town.

On leaving Cape Town Professor Wintrobe will spend a few days in Durban before leaving for East Africa.

* * *

C.S.I.R. Bursaries. The South African Council for Scientific and Industrial Research invite applications for 4 postgraduate bursaries for directed research during 1959. Successful candidates will be required to do research in the C.S.I.R. laboratories in one of the special fields. The bursars will be paid £250-400 a year, which is tenable for one year at a time and may be renewed if satisfactory reports are received on the bursar's progress. Applications must be made on the Council's Application Form No. R.A. 1 and are subject to the Council's regulations. Forms and regulations are obtainable from the Registrars of South African Universities, or from the Secretary/Treasurer, C.S.I.R., P.O. Box 395, Pretoria. Applications should where possible be submitted through the Registrars of Universities to reach the Council not later than 31 August 1958. Amongst the subjects of research for which the bursaries are available are the following:

Application of radio-isotopes. X-ray fluorescence with reference to techniques and applications. Hospital research—ward planning. Adsorption studies. Protein chemistry. Enzyme chemistry. The development and application of selective membranes. The biology of trickling filters at sewage works. The ecology of bilharzia-carrying snails in South Africa. The bionomics of *Entamoeba histolytica*. Biochemistry and biophysics in relation to human nutrition and metabolism. Clinical dietetics. The physiology and biochemistry of fat-soluble vitamins. The use of radio-isotopes in clinical diagnosis. Methods for the estimation of insulin and steroids in the blood. The biological evaluation of insecticide residues on food products. Electroencephalography. Efficiency and productivity of Native operatives. Environmental influences on mental and physical growth.

* * *

Unie van Suid-Afrika, Departement van Gesondheid. Nuusbrief nr. 30 *van* 1958. Opgawe van gedugte epidemiese siektes en poliomiëlitis in die Unie gedurende die tydperk 18 tot 24 Julie 1958.

Pes, Pokkies. Geen.

Tifuskoors. Kaapprovinsie. Vier (4) Naturellegevalle in Boswana-afdeling van die Matyantya-lokasie, Glen Grey-distrik.

Poliomiëlitis

	Bl.	*Nat.*	*Kl.*	*As.*	*Totaal*
Transvaal	3	3	3	–	9
Kaapprovinsie ..	3	–	1	–	4
Oranje-Vrystaat ..	–	–	–	–	–
Natal	–	–	–	1	1
Totaal ..	6	3	4	1	14

Korreksie:

Oranje-Vrystaat: Een (1) Naturellegeval van poliomiëlitis wat in Nuusbrief nr. 28 van 1958 vermeld is, word nou gediagnoseer as ‚nie poliomiëlitis'.

Natal: Een (1) Blanke geval van poliomiëlitis wat in Nuusbrief nr. 25 van 1958 vermeld is, word nou gediagnoseer as ‚nie poliomiëlitis'.

Plaaslike Besture		*Bl.*	*Nie-bl.*
Transvaal:			
Benoni-Munisipaliteit	S	1	
Johannesburg-Munisipaliteit ..	S	1	6
Vereeniging-Munisipaliteit	S	1	
Kaapprovinsie:			
Humansdorp-Afdelingsraad ..	P	1	
Port Elizabeth-Munisipaliteit ..	S	1	
Uitenhage-Munisipaliteit	S	1	1
Natal:			
Durban-Munisipaliteit	S	1	

Korreksie:

Oranje-Vrystaat: Een (1) Naturellegeval in Viljoenskroon-distrik wat in Bylae tot Nuusbrief nr. 28 van 1958 aangetoon is, is nou gediagnoseer as ‚nie poliomiëlitis'.

Natal: Een (1) Blanke geval vanuit Pinetown-munisipaliteit wat in Bylae tot Nuusbrief nr. 25 van 1958 aangetoon is, is nou gediagnoseer as ‚nie poliomiëlitis'.

P = Plattelands S = Stedelik

* * *

The Third International Congress of School and University Health will be convened in Paris on 6-8 July 1959 by the French Association of School and University Health Services, under the patronage of the French Ministry of National Education. It will be held in the new UNESCO buildings, Paris. The Congress is organized so as to appeal to school doctors, doctors concerned with student services, paediatricians, phthisiologists, neuro-psychiatrists, psychologists, school nurses, educationists, specialists in problems related to children and youth, and all others interested in health and medical services in schools and universities in whatever country. Directors of national, provincial and municipal services of school and university health and those responsible for national school and university health associations, and all others desiring to participate in the Congress, are asked to communicate as soon as possible with the Secrétariat du Congrès d'Hygiène scolaire et universitaire, 13 rue du Four, Paris (6*e*), stating also whether

they desire to contribute to the discussion and on what subject or topic.

The provisional programme will cover: Infectious diseases in schools (school absences for contagious diseases, and the detection, control and prevention of acute articular rheumatism in school children); school environment and child health; Epilepsy in schools. Rapporteurs and co-rapporteurs from various countries will be appointed. Speakers may use English, French, German, Italian or Spanish, and their remarks will be translated simultaneously in English and French.

Immediately after the Congress a number of excursions will be organized.

REVIEWS OF BOOKS : BOEKRESENSIES

PRACTICAL AUDIOMETRY

Leitfaden Der Praktischen Audiometrie. Zweite, verbesserte Auflage. By Prof. Dr. Bernhard Langenbeck. Pp. viii+196. 52 Figures. Price: DM 24.– (packed). Stuttgart: Georg Thieme Verlag. 1956.

Contents: I. Abteilung: Einführung. I. Die klassische Untersuchung des Gehörs. II. Die Audiometer. II. Abteilung: Hürschwellenaudiometrie. III. Die Methodik der Hürschwellenauffindung. IV. Die Auswertung der Audiogramme. V. Diagnostik. III. Abteilung: Die überschwellige Audiometrie. VI. Der Lautheitsausgleich (Recruitment). VII. Verwendung von Geräuschen in der überschwelligen Audiometrie. VIII. Beziehungen der überschwelligen Befunde zueinander. IX. Sprachaudiometrie. Anhang: Simulationsproben. Rückblick. Literatur.

In the revised second edition of his book on Audiometry, Prof. Langenbeck of Bonn, lives well up to the scientific tradition of German audiology. This volume deals in most comprehensive fashion with all the problems of audiometry and in fact all the problems of testing the hearing.

He begins the book with an account of the usual methods of testing by voice. Then goes on to discuss the modern audiometer and in the later chapters discusses various uses to which an audiometer can be put. He deals exhaustively with pure tone threshold audiometry, loudness balanced tests and their application to the presence of recruitment, the finer details in testing for differential signs in nerve deafness, for instance, differentiation between hair cell deafness and deafness due to a lesion of the acoustic nerve itself.

Tests for malingering appear in one of the later chapters of the book. There is a full bibliography which is collected at the end of the volume and not at the end of each chapter. It is gratifying to note that the work of English-speaking authors is given due recognition.

There are a few minor criticisms. The review copy was wrongly bound, certain pages were bound in the wrong order whilst a few pages were omitted altogether.

Lastly, it seems a pity that a book of such integrity and scientific worth should be spoilt by being bound in soft covers instead of the more usual hard covers. The book can be highly recommended as an advanced treatise on audiometry in all its phases for the specialist otologist.

B.T.B.

THE WORKMAN'S EAR AND HEARING

Noise and Your Ear. By Aram Glorig, Jr., M.D. Pp. viii+152. Illustrations. $6.50. New York and London: Grune & Stratton, Inc. 1958.

Contents: Foreword. Preface. *Section I. Introduction.* 1. History of Noise and Hearing. 2. Brief History of the Development of Compensation Laws. 3. Glossary of Audiological and Medicolegal Terms. *Section II. The Ear and Hearing.* 4. Anatomy of the Ear and Theories of Hearing. 5. Psychoacoustics, the Measurement of Man's Responses to Sound. *Section III. Audiometry.* 6. Pure Tone Audiometry. 7. Speech Audiometry. 8. Test Procedures, Personnel and Records. 9. Test Environment and Test Equipment. *Section IV. Hearing Loss.* 10. Hearing Loss, General and Occupational. 11. Effects of Hearing Loss on Social Activity and on Job Activity. *Section V. Effects of Noise Exposure.* 12. Effects of Noise Exposure. *Section VI. Conservation of Hearing.* 13. Guide for Conservation of Hearing in Noise. *Section VII. Compensation and Rating Scales.* 14. Compensation and Rating Scales. Appendix 1. Organizations whose Activities are Directly Related to the Problems of Hearing Loss and of Noise. Appendix 2. Partial List of Manufacturers of Equipment, Ear Protection and Test Rooms Used for Hearing Conservation. Appendix 3. References for Further Reading. Index.

This little monograph is the first of a new series which will deal with Industrial Medicine.

The series, 'Modern Monographs in Industrial Medicine', is designed for industrial physicians, including those engaged in general practice or in surgery who derive at least part of their practice from industry.

Industrial medicine is basically preventive medicine. So important are the problems, both medical and legal, associated with the effects of noise, that this subject was deemed of priority importance and chosen for the monograph. Dr. Glorig, whose work in this field is known the world over, is the Director of Research of the Sub-committee on Noise in Industry, Committee on Conservation of Hearing of the American Academy of Opthalmology and Otolaryngology.

The book should be read and studied by all workers interested in the field of industrial medicine, especially those interested in industrial deafness. It has an appeal, therefore, to doctors engaged in Workmen's Compensation Act problems and to otologists whose interests incline towards the same field. The book, in a short compass, gives all the essential data which are necessary in assessing the effects of noise on the human ear. Various methods of calculating auditory disability are discussed and a suggested scheme is given. This suggested scheme seems practical and worthy of consideration by the Workmen's Compensation Commissioner in this country. The scheme also has value in assessing auditory disability due to accidents and should be of great help to otologists appearing in court in such matters.

Included in the book is a very complete glossary of terms used in auditory physiology and in fact in acoustics generally.

I cannot praise too highly the contents of this book and believe that it will be a most valuable addition to any otologist's library.

B.B.

PSYCHIATRY AND PHARMACOLOGY

The Relation of Psychiatry to Pharmacology. By Abraham Wilker, M.D. Pp. viii + 322. $4·00. Baltimore: The Williams and Wilkins Company. 1957.

Contents: Introduction. 1. The Effects of Drugs on Human Behavior. 2. Theories and Mechanisms of Drug Actions. General Conclusions. References. Index.

This in an important book of the nature of a lengthy and detailed pharmacological review. It presents a survey of drugs used in psychiatry. So valuable is this work that its early publication, at low cost, has been sponsored by the American Society for Pharmacology and Experimental Therapeutics.

There has been unprecedented interest in recent years in the use of drugs in psychiatry and a tremendous amount of information is scattered widely through medical literature; in the volume under review the author selected 889 references from English, French and German literature. The subject is important not only because of drugs used in the treatment of psychoses and pshychoneuroses but also because of their use as tools to produce 'model psychoses' and to test theories about the cause and pathogenesis of behaviour disorders. Rapid developments, many of highly technical nature, are taking place in psychiatry and pharmacology. In this volume a survey is made in both these disciplines. In view of the immensity of the subject a limited number of drugs has been reviewed in detail, others only incidentally, and only certain theories of drug action and theories of behaviour are considered.

The material is arranged in two main sections. In the first, 'The effects of drugs on human behaviour,' details are given of the degree and manner in which drugs can effect changes in cerebral metabolism, neural organization and environmental adaptation. The second section gives details on the 'theories and mechanisms of drug actions'. The approach to all questions and answers is that of the experimental psychiatrist.

Abundant evidence is provided on the detection and manipulation by drug action of a host of variables that influence behaviour and the inadequacy of certain theories is exposed. Emphasis is made that in psychiatry proper controls are urgently needed in studies of the comparative effects of drugs on behaviour, and in pharmacology the further development of techniques for the study of brain activity and behaviour is a major problem. A joint effort is needed to establish 'pattern-specifity' in the actions of drugs, to detect 'common denominators' on which they act; in this way it is indicated that the testing and revision of theories of behaviour may lead to progress in the clinic and the laboratory.

There is much detail in this volume on drugs used to produce coma, 'psycho-exploration,' tranquillization, elevation of mood,

'model psychoses,' and the biochemical, neurophysiological and psychological mechanisms involved.

This timely, detailed and critical survey of the literature in a rapidly growing field is most welcome to pharmacologists and psychiatrists and to other interested readers.

N.S.

CHRONIC BRONCHITIS, EMPHYSEMA, AND COR PULMONALE

Chronic Bronchitis, Emphysema, and Cor Pulmonale. By C. H. Stuart-Harris, M.D. (Lond.), F.R.C.P. and T. Hanley, M.D. (Lond.), M.R.C.P. Pp. vi + 246. 61 Figures. 42s. + 1s. 3d. Postage. Bristol: John Wright & Sons Ltd. 1957.

Contents: I. The Definition of Chronic Bronchitis. II. The Clinical Picture of Chronic Bronchitis. III Exacerbations, Terminal Illness, and the Morbid Anatomy of Chronic Bronchitis. IV. The Differential Diagnosis of Chronic Bronchitis. V. Infection and its Relation to Chronic Bronchitis and Emphysema. VI. Emphysema and the Function of the Lungs. VII. Emphysema (continued). VIII. Pulmonary Heart Failure. IX. The Pathological Physiology of Cor Pulmonale. X. Treatment. XI. The Epidemiology and Pathogenesis of Chronic Bronchitis. Index.

This book is a monograph in which the authors have attempted to draw together the results of diverse studies relating to various aspects of chronic bronchitis, emphysema, and pulmonary heart failure. In this they have succeeded admirably. The work has been done in Sheffield, a large industrial centre in Britain, and was conducted by the staff of the Department of Clinical Medicine of the University of Sheffield. After defining the term 'chronic bronchitis,' the authors give an excellent clinical account of the condition in its various forms, and stress the relation of infection to chronic bronchitis and emphysema. Thereafter the subject of pulmonary heart failure is reviewed indicating many of the difficulties in understanding the problem, both in its haemodynamics and humoral mechanisms. This leads naturally to a review of the pathological physiology of cor pulmonale. The subject of treatment and its problems is expertly presented. Lastly an interesting chapter on epidemiology and pathogenesis of chronic bronchitis is added, and the subject of polluted air, dusty occupations, carbon particles and sulphur dioxide in the air and the problem of excessive smoking in etiology is reviewed. This is an authoritative monograph of interest to all branches of medicine.

A.L.

OPHTHALMOLOGICAL RECORD

A Century of International Ophthalmology—1857–1957. Written at the Request of the International Council of Ophthalmology by Sir Stewart Duke-Elder. Pp. 91. Illustrations. 12s. 6d. London: Henry Kimpton. 1958.

Contents: Preface. *Part I. The International Ophthalmological Congresses.* The First Congress: Brussels, 1857. The Periodic International Ophthalmological Congress. The first Interim Period, 1909-29. The Era of the International Council. *Part II. The International Council of Ophthalmology.* The International Federation of Ophthalmological Societies and its International Relationships. Sponsored Ophthalmological Bodies. Regional Ophthalmological Societies. The Internal Activities of the International Council. The Past and the Future. Appendix.

The author, who is well known in South Africa, has produced an interesting and complete history of the first century of international ophthalmology in all its aspects. Such an historical survey of one of the oldest, perhaps the very oldest, speciality in medicine, establishes the international nature of co-operation in the interest of ophthalmology up to the present time. A detailed description is given of each of the seventeen congresses held in different countries under the presidencies of outstanding men of international fame. Photographs of these presidents are reproduced.

The first congress was held in Brussels shortly after the ophthalmoscope was demonstrated and before its clinical value was fully appreciated. It was also an opportune time for the discussion of the widespread appearance of trachoma in a virulent form, causing a social and military problem.

At the second congress, in Paris, 1862, the most important landmark in ophthalmology was the presentation of Snellen's test-types; and so, at each of the subsequent congresses something which later became of historical importance as an ophthalmological milestone, is presented in an interesting Duke-Elder style. The immense value of international congresses in the welding of the world-family of ophthalmology into a single unity, is fully stressed. Consideration is given to the problem of holding future congresses. Many aspects of this problem are discussed: the numbers; the value, from a scientific point of view, of attendance by an unmanageable number of delegates; the accommodation.

J. S du T.

YEAR BOOK OF OBSTETRICS AND GYNAECOLOGY

The Year Book of Obstetrics and Gynaecology—1957–1958. Edited by J. P. Greenhill, B.S., M.D., F.A.C.S., F.I.C.S. (Honorary). Pp. 597. 33 Figures. $7.50. Chicago: The Year Book Publishers, Inc. 1957.

Contents. Obstetrics. Pregnancy: Physiology. Abortion. Extopic Pregnancy. Complications. The Toxaemias. Labor: General. Analgesia and Anesthesia. Complications. Operative Obstetrics. Uterine Hemorrhage. Puerperium. The Newborn. *Gynecology.* General Principles and Diagnosis. Infertility. Operative Gynecology. Infections. Nonmalignant Neoplasms. Malignant Tumors. Menstrual Disorders. Endocrinology.

This Yearbook contains abstracts of articles taken from journals received between July 1956 and July 1957. In the editorial comments which are written in the form of a discussion, after many of the interesting, new or controversial subjects reference is also made to articles of previous years. As in previous issues, these editorial comments are very good and add to the usefulness of this book. The articles are well quoted—reviews being neither too long nor too short. There is however, a strong American bias in the choice of articles discussed. British and Commonwealth journals are quoted sparingly. One would have liked to read more about the Continental journals. But possibly that would have made the Yearbook unmanageably large.

Its present size makes it a handy reference book for the post-graduate student and interesting concentrated reading for the busy obstetrician and gynaecologist or general practitioner.

J.N. de V.

CORRESPONDENCE : BRIEWERUBRIEK

THE MEDICAL COUNCIL ELECTION

To the Editor: In a letter[1] by a senior member of the Medical Council in the *Journal* of 12 July 1958, some interesting points are made concerning election to this body.

Now that the Medical Council is under discussion, the profession may well look into the possibility of having the number of elected members increased. With the mushroom growth of small medical schools, their representatives already pseudo-government appointees, and the President a government appointee, the practising profession can hardly be considered to be properly represented.

In regard to the matter of medical education in our country, those who have seen beyond the hazy horizon of the F.R.C. syndrome know that we need more than a minor revolution in this respect. There is a mass of evidence to prove this. One example as an illustration of what is meant: An intern in the last month of his year's training has to do a sternal puncture which he has not only never done under supervision, but has not even seen done. The result was fatal for the patient.

Now in all modern schools of standing every possible diagnostic procedure has to be carried out by all interns and their proficiency certified by the departmental head. Teaching is done mainly where the problem is and the theory read in text-books at home instead of endless listening to lectures. The results speak for themselves.

One feels sure that we shall find 9 doctors who will join Dr. Impey in carrying on with his good work and enable us in this country to catch up with the times.

G. P. Fourie

S.A. Mutual Buildings
Parliament Street, Cape Town
22 July 1958

1. Impey, R. L. (1958): S. Afr. Med. J., 32, 715.

THE MEDICAL COUNCIL ELECTION

To the Editor: Dr. Impey's quinquennial reminders of the imminence of Medical Council elections must surely be among the more remarkable communications published in our *Journal* from time to time. It is difficult to appreciate what motivated him in issuing this latest avuncular homily, unless it is to be

regarded as the opening salvo in his own election campaign. A contribution covering the scope of his letter would have been more appropriate from one who was retiring from the Council's activities. There is no evidence in his letter that this is in fact his intention.

It is pertinent to inquire by whom he was so readily persuaded to put pen to paper.

Dr. Impey refers to himself as a senior member of the 10 elected members. May one ask how seniority is assessed in the Council and by whom? Is it determined (*a*) by physical age, or (*b*) by mental age, or (*c*) by the number of miles logged in the service of the Council? If there are senior members, are there also senior-juniors and juniors? And who are they? I have studied the Act and fail to find any basis for such a differentiation as has been inferred by Dr. Impey.

In his capacity as a self-appointed authority on the functions of the Council, Dr. Impey has delineated a very restricted account of the scope of the Council's activities. The fact that the Council concerns itself, *inter alia*, also with such fundamental and controversial matters as the registration of specialists, the role of ancillary services, the fees which a practitioner may charge, medical ethics in relation to corporate bodies and benefit societies, these all seem to have escaped Dr. Impey's attention in what can only be construed as an electioneering statement issued even before the term of the present Council has expired.

I am deeply sensible of the fact that many of our colleagues serve the profession in many equally demanding ways not only on the Medical Council but also elsewhere; and it is remarkable that not one of them has found it desirable or necessary to publish either a record of their travels or of their personal sacrifices.

Lest my motives in writing this letter be misunderstood I wish to place on record (1) that no-one 'has suggested to me that a useful purpose would be served' by my doing so, and (2) that I have no intention of offering myself as a candidate in the forthcoming Medical Council election.

Jonathan Gluckman

1206 Medical Centre
Jeppe Street, Johannesburg
25 July 1958

THE ORIGIN OF THE ℞ SIGN

To the Editor: In your issue of 19 July, Dr. N. Finn[1] questions Dr. S. Levin's supposition that the familiar ℞ before a doctor's prescription is derived from ancient Egypt, and states the popular belief that it is short for the Latin word *recipe*. But according to Sir William Osler ('The Evolution of Modern Medicine')—and I would be the last to question his learning and his knowledge of medical history—the sign *has* a much more ancient heritage. It is derived from the eye of the Egyptian god Horus. 'This eye, the symbol of sacrifice, became next to the sacred beetle the most common talisman of the Country.' He quotes another authority, who says: 'that this sign or symbol passed with the knowledge of alchemy or chemistry into the hands of the Greeks and later Arabs. In a cursive form it is found in the medieval translations of Ptolemy, the astrologer, as the sign of the planet Jupiter. As such it was placed upon horoscopes and upon formulae containing drugs made for administration to the body, so that the harmful properties of these drugs might be removed under the influence of the lucky planet. At present in a slightly modified form it still figures at the top of prescriptions'.

So Dr. Levin's contention in his article published in the *Journal* of 28 June is quite correct.

J. van Schalkwijk

42 Somerset Street, Graaff-Reinet, C.P.
24 July 1958

1. Finn, N. (1958): S. Afr. Med. J., 32, 744.
2. Levin, S. (1958): *Ibid.*, 32, 663.

INTERNATIONAL JOURNAL OF MEDICINE IN INDUSTRY

To the Editor: As one of the overseas editors of *Industrial Medicine and Surgery*, I would like to direct the attention of readers of our *Journal* to a new departure in the affairs of that periodical. From now onwards *Industrial Medicine and Surgery* proposes to become more active on the international level and call itself the *International Journal of Medicine in Industry*. It is felt that occupational health is becoming more international in character year by year.

This step will involve no radical change in the magazine. However, it will be made to reach more industrial countries overseas and a higher percentage of manuscripts originating in them will be published. If English is not the language used for an article then an abstract of it in English will also be published.

The writer hopes that it will be possible to procure technical manuscripts on investigative work being done in the Union of South Africa.

H. O. Hofmeyr

London and Lancashire House
148 St. George's Street, Cape Town
23 July 1958

OUR ASSOCIATION IS 'IN THE RED'

To the Editor: All those members who have read the carefully considered letter from Dr. J. D. Joubert, our energetic and conscientious Honorary Treasurer, will be perturbed to learn of the dire financial straits we are in. I agree with all he says but strenously object to an appeal for donations. I am prepared to give the Association as much of my time as I can spare in helping our Branch Council, supporting the official *Journal*, and assisting with all other Branch and divisional activities both medical, politic and social, but I refuse to give a halfpenny as a charitable donation for (to my mind) three good reasons:

(*a*) It is unbusinesslike.

(*b*) I believe only about 25% of the members will respond and these will be the usual ones that do the work anyhow.

(*c*) The response will not materially help the deficit.

To meet the critical situation I suggest that:

1. An urgent extraordinary meeting of Federal Council (or the Executive) be called to regularize a compulsory levy on all members equal to twice the amount of the yearly subscription, half of this to be regarded as a loan to the Association to be repaid as soon as the general funds permit. These monies could be repaid in lieu of future subscriptions.

2. That the existing subscriptions be doubled as soon as the Federal Council machinery permits.

3. That the most excellent suggestions put forward by Dr. A. W. S. Sichel regarding the reduction in size and the constitution of Federal Council be given priority consideration at the next meeting of Federal Council. These suggestions will effect a material reduction in running costs of the Association; each meeting of the Council now costs us approximately £1,000.

4. That all Branches and Divisions call meetings within their areas to inform their members of the reasons for these drastic financial measures, to prevent a tendency among some to consider resignation from the Association. Such a decision would be largely due to a misunderstanding of the situation.

I am not alone in believing that some members within our Association would not be unduly concerned if the Association became bankrupt. It would provide an opportunity to remodel the organization along lines more acceptable to themselves. Let those whom the boot fits pull it on, and by their protest methinks we may find who these gentlemen are. I may be entirely wrong in thinking that our Medical Association of South Africa is doing and has done a good job of work for the practice and science of medicine in our country, and if shown to be wrong, I will withdraw all I have said and in particular will unreservedly withdraw the slur implicit in the opening sentences of my last paragraph. If we have differences let us discuss them openly and clear the air. Our Association is 'in the red' and needs the help of all its members. Let us rally round, be united and put it once more 'in the blue'.

P. J. M. Retief

85 St. George's Street, Cape Town
22 June 1958

[1. The Federal Council had before it at its last meeting a proposal to impose a compulsory levy on all members, but the Association's constitution does not allow of this procedure. The plan to ask members to make donations is in effect, the imposition of a 'voluntary' levy.

2. The Federal Council has already agreed that the Association subscription shall be raised from £2 2s. 0d. to £4 4s. 0d. as from 1 January 1959, which is the earliest time allowable under our Constitution.

3. Dr. Sichel's plan of reorganization is being considered by individual Federal Councillors at present and will be placed before the full Council at its next meeting.—*Editor.*]